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The Pennsylvania School Journal

DEVOTED TO

SCHOOL AND HOME

EDUCATION

J. P. WICKERSHAM, EDITOR.

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THE
SCHOOL JOURNAL
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Vol. 28. NOVEMBER, 1879. No. 5.

INDUSTRIAL EDUCATION IN EUROPE.*

AS IT RELATES TO AGRICULTURE.

IT was a part of my mission in visiting the different countries of Europe, to examine schools established with a view to promote the several industrial interests; but as my attention was mainly directed to art schools and schools of manufacturing and mechanics, what I learned there of education as it relates to agriculture was picked up incidentally, and should not have the weight properly attached to close and careful personal observations. But to give a full account of the little that I saw and learned, would require a good sized volume, and all I will now attempt to do is to present to the Board a brief outline of the subject, in the hope that it may prompt the desire for further information.

1. *Agriculture in the Public Schools.*—The elements of the natural sciences, which form the bases of all knowledge relating to agriculture, are taught almost everywhere in the public schools of Europe. The instruction is mostly given orally, in the form of object lessons, but sometimes appropriate manuals are placed in the hands of the pupils for study. They do not make the great mistake of our schools in compelling their pupils to spend so much time upon lessons in the details of Geography that are of no use to them, and lessons in abstract Arithmetic and Grammar they do not understand, and keeping them ignorant of the interesting world of nature in which they live and move. In some countries, it is a common thing to see, even in the lowest grade of schools, collections of objects, minerals, plants, fruits, grains, grasses, woods, etc., upon which lessons are frequently given.

In addition to this kind of instruction, so useful to the farmer, agriculture is taught as a branch of learning in thousands of public schools in France, Germany, Switzerland, Belgium, and other countries. Its elementary principles are simply stated and easily exemplified, and I can readily understand, what I was frequently told, that no other study of the whole course awakens more interest. The profit, even to those who never intend to become tillers of the soil, is vastly greater than can result, for example, from the study of long lists of the names of mountains, rivers and towns, in the far-off countries of Asia or Africa. And this kind of instruction is not only given theoretically, in the schoolhouse, but practically in the adjacent grounds. The building in which school is kept in villages and country districts on the continent of Europe, is generally a school-house and a dwelling-house combined. Here the teacher lives, as well as teaches. He is allowed the use of the grounds attached to the schoolhouse, oftentimes several acres in extent, every square inch of which is cultivated with the greatest care. I have seen these grounds divided into a yard with grass and walks, flowers and shrubbery; a garden with a variety of vegetables; a small orchard and

*A Paper read by the Superintendent of Public Instruction, Mr. Wickersham, before the State Board of Agriculture, at a meeting held at Mercer, October 15 and 16.

vineyard, and several miniature fields with growing crops. The boys spend a part of their time on these grounds at work with the teacher, and, under his direction, learn the arts of lawn dressing, gardening, fruit growing, and farming generally. It is a pleasant sight to see a teacher and his boys employed in this way, and no one can doubt that in such cases the instruction imparted outside of the school room is quite as valuable as the instruction imparted within it. Interest is added to the picture, too, when you find that the sisters of these boys are at the same time, and in the same schools, learning to sew, knit, and cut out garments, and sometimes take lessons in practical house-keeping. The spirit that animates this kind of practical instruction, is shown in a circular somewhere met with, issued by one of the agricultural inspectors to the teachers of the Vosges, in France. He urges them not only to convert the lands at their disposal into schools for teaching practical farming, gardening and fruit growing, but to accompany their pupils from time to time to the best-kept farms of the district, and to make a special study of the stables, fields, cattle-houses, and vineyards.

Agriculture is taught both theoretically and practically in a large number of the Irish National Schools. I had barely time to look at one of these, the one at Larne. It is a school quite similar to one of our graded or union schools, with an agricultural department and a piece of land which the boys cultivate. There are only seven acres in the little farm, and yet the management contrives to raise upon it all kinds of crops incident to the climate; to keep horses, cows, pigs and poultry; and to set apart space for an orchard, a garden and a lawn. The instruction in the school embraces the elements of botany, zoology, mineralogy and chemistry; the formation, nature and difference of soils; the rotation of crops; draining, trenching and subsoiling; the raising and feeding of stock; gardening, fruit-growing, etc., etc. In their outdoor work on the farm, the boys apply what they learn theoretically, test methods, and make experiments.

2. *Agriculture in Higher Institutions.* I have said something as to what is done in European countries in the way of imparting instruction in agriculture in the elementary schools; I have now to inquire how the same work goes on in the higher institutions, the Normal Schools, the Polytechnic Schools, and the Universities.

Institutions for the training of teachers are called Normal Schools in Europe, as well as in America; but they are much more numerous in the most enlightened countries abroad than with us. In Germany alone there are nearly two hundred of these schools and in France an equal number. The courses of study in the Normal Schools are arranged with special reference to the training of teachers; but as showing the high consideration given to the farming interest, they very frequently include instruction in theoretical and practical agriculture. The governmental authorities desire to have this kind of instruction imparted in the elementary schools, and they are wise enough to see that the only way to bring it about is to prepare teachers who will be able to carry their wishes into effect. Many of the Normal Schools have farms connected with them, and the student-teachers are not only required to study, but to work. A part of the course is that they shall be able to perform with skill the work of the farm and the garden. The students in our Normal Schools might object to this kind of discipline; but I am not at all sure it would not be as advantageous here as in the Old World.

Not only is instruction in agriculture given in many of the Normal Schools, but provision is made in some of the Agricultural Schools for a special course for teachers. This is especially the case at the fine establishment at Glasnevin, three miles from Dublin. Here there is a model farm of one hundred and twenty-eight acres, with buildings well adapted for the purpose, a nursery, gardens, etc. The students are mainly young men who are preparing for teachers. They study and work alternately, and, after graduation, those who propose to follow the business of teaching go forth to spread a knowledge and diffuse a love of agriculture through the schools, among the people of the rural districts of the country. More than a thousand teachers have been prepared in this way at Glasnevin. At the Agricultural Institute at Hohenheim, near Stuttgard, Germany, one of the most celebrated institutions of the kind in Europe, there are several special courses for teachers, one for students from the neighboring normal schools, another for teachers during vacations, and still another to prepare teachers for holding evening agricultural schools during the winter months.

We have polytechnic schools in this country, but they cannot be compared in any respect with the great polytechnic schools in Europe. I visited schools of this kind in Zurich, Munich, Vienna, Prague, Dresden, Berlin and Paris. Their object is to impart a thorough scientific and practical education.

Most of them are well supplied with philosophical apparatus, and have rich and well arranged scientific collections, industrial museums, art galleries and botanic gardens. Some of them have an attendance of over a thousand students. Their course of study is very full and complete, including, in many cases, a department of agriculture. With engineers, architects, chemists, machinists, merchants, and other skilled masters of the matter and the forces of nature, they aim to make good farmers—farmers who understand the principles that govern their work.

Nor do the great Universities of Europe overlook the interest of agriculture, as is too apt to be the case with the higher educational institutions of this country. Regular courses of lectures are delivered on this subject at the Universities of Edinburg, Bonn, Berlin, Halle, Munich, Leipsic, Giesen, Jena and others. It will be remembered, as an example of the kind of instruction imparted in these courses, that Liebig delivered his celebrated lectures on Agricultural Chemistry at a German university. Some of these universities, too, even have agricultural schools and model farms connected with them. The Agricultural Institute at Jena is an integral part of the University of Jena, and the Agricultural College at Poppelsdorf is under the same management as the University of Bonn. The Royal Academy of Agriculture and Rural Economy, at Eldena, occupies lands belonging to the University of Griefswald, and its professors are in part the same.

3. *Special Schools for Instruction in Agriculture and Related Subjects.*—The governments of Europe not only see that instruction in agriculture is largely given in their elementary schools and in higher institutions of learning; but they have established in great numbers special schools for this purpose. There are many schools of agriculture, horticulture, forestry, veterinary, and, here and there, one for meadow culture, fruit culture, silk culture, the culture of the vine, sheep raising, the raising of bees, working in flax, etc. There are probably one hundred such schools in France, an equal number in Germany, and as many proportionally in Holland, Switzerland and Belgium. Some of these schools are small, not having more than ten students, but at others the attendance is large.

The special agricultural schools of Europe differ so much in kind and grade that it is difficult to characterize them without a detailed description much too long for the purposes of this paper. We will notice only those that seem to be of most interest.

First, there are schools whose main object it is to make expert laborers on a farm. They are practical farm-schools. In these the pupils have very little to do with books or theoretical instruction. They work nearly all the time with their teachers in the stables, the gardens, the vineyards, the orchards, the fields. When not thus employed, especially during the winter months, they sometimes review their work with reference to the principles involved it it, read agricultural publications or listen to lectures on agriculture. More rarely they pursue a course in what are called here the common school branches. But these schools are not designed to make scholars or thinkers. Those who attend them are the sons of peasants, are poor, and seldom own land. The purpose is to acquaint them with farming operations, to accustom them to handle tools, to make them active and skilful tillers of the soil. In Germany, such institutions are called Ackerbauschule.

Next in grade above the Ackerbauschule are the schools for practical farming. These are designed for young farmers and farmers' sons. They possess rooms for study and recitation, and a farm for work. No pupils are admitted who have not received a good elementary education. In summer nearly all the time is spent out-of-doors, on the farm; in winter several hours are given daily to the study of the sciences that relate to agriculture. The object is to make the pupils acquainted with all the branches appertaining to the business of a well-organized farm, and especially to explain the underlying principles of farming operations. Instruction is given both from text-books and by courses of lectures, and many of the schools are well supplied with apparatus and possess good scientific collections. The practical instruction is based on the plan of gradually perfecting the pupils in all the varied work of the farm. They commence with simple operations, and then pass on to those more difficult. Practice is given them, alternately in feeding and caring for stock, in making and using manures, in cultivating and gathering crops, in gardening and fruit-growing, in draining and irrigating, and in all other varieties of farm work. There are schools of this class at Zwätzen, Annaberg, Schleissheim, and elsewhere in Germany. To this class belong also the Farm Schools or Model Farms of France. France has more than fifty of these institutions, and they are rapidly multiplying. There are nearly four hundred arrondissements, corresponding to our counties, and it is the intention of the Governmeut to establish a Farm

School in each. The buildings and land belonging to these schools are generally owned by private parties, and the schools are carried on at the risk of the owners. All schools, however, that are approved by the Government receive a subsidy sufficient to pay the salaries of the teachers and the boarding of the students. Each school must have at least twenty-four pupils, and must be so conducted as to present a good example of tillage to the section of country in which it is situated, and to show a fair return of profit. Rigid inspections by Government officers frequently take place, and institutions that are not well-managed are discontinued.

The object of these Farm Schools is, first, to furnish an example of good farming to the farmers of the district; and, second, to form by proper instruction and training a body of skilled agriculturists. All pupils must be over sixteen years of age, and possess a good elementary education. The work on the farms is performed wholly by the pupils and their teachers. A teacher is always present to take part in and direct the work. It is his duty to explain on the ground why one instrument is preferable to another, why certain operations should be performed in a particular way and not differently, and what the causes are which produce the effects noticed. In short, all the work done is considered in the nature of an experiment illustrating a principle, and thus the head is used to direct the hand. And further, the work on each of these Model Farms is so managed as to epitomize the farming operations of a whole section of country. Whatever crops are raised in its neighborhood, are raised on the Farm. Nearly all of the farms engage in breeding and fattening stock, and possess dairies, gardens, and orchards. Some of them cultivate grapes, take care of forests, keep sheep, grow silk, make honey, etc. The course at these Farm Schools is generally three years, and in addition to the practical instruction, which is the main object, the pupils receive lessons in the elements of agricultural science, and in subjects that will be most useful to them in working or managing a farm.

Would it not be possible to organize our three Pennsylvania Model Farms somewhat after the manner of these French Model Farms? Or, what stands in the way of such an enterprise being set on foot by one of our County Agricultural Societies, or by a body of public spirited farmers? There are among the very best Farm Schools in France, those that furnish free boarding and free instruction to from twenty-five to fifty pupils, at a cost to the Government not exceeding $2000 or $3000 a year.

We now come to speak of the Agricultural Colleges, or institutions for instruction in Agriculture of the highest grade. These colleges have theoretical courses in all the branches of learning that relate to Agriculture, and ample facilities for teaching practical farming. Among the most celebrated are the institutions at Poppelsdorf, near Bonn, at Hohenheim near Stuttgard, at Weihenstephan, near Munich, Germany; at Krumman, Bohemia; at Grignon, near Paris, France; and at Glasnevin near Dublin, Ireland. All the schools of this class have houses for boarding the pupils, apartments for the teacher, and rooms for lectures and recitations. Most of them have libraries, reading-rooms, laboratories and collections of farm products, and of tools and machines used on a farm. They are well supplied with barns and other buildings necessary in conducting farming operations on a large scale and in great variety. The farms are generally large tracts, with a variety of soils. At Hohenheim, there are 825 acres under cultivation, with an adjoining tract of 5000 acres of Government forest. The farm at Weihenstephan consists of 650 acres, and that Grignon of 1,170 acres. Everywhere fields are set aside for experiments. Botanic gardens are frequent; stock of different kinds, horses, cattle, sheep, are bred and cared for. Herds of cows are kept for dairy purposes. Much attention is given to the raising of poultry, and at some of the schools there are stocks of bees. You will find here, as at the farm schools, nurseries, orchards, gardens, forests, vineyards, lawns, meadows. Great care is taken with the manufacture of manures. Cider, vinegar and beet sugar, are sometimes made. Silk-culture is carried on to some extent. Shops on the farms usually make and repair the farm tools and machinery. Fill up this outline with the necessary details, place in the management a body of professors as expert in practical farming as they are learned in scientific agriculture, and you will have an idea of the practical advantages these colleges offer to the young farmer. The standard for admission is as high as that for admission into one of our literary colleges, and the course continues three years. As a general thing, the pupils work nearly all the time the first year, about half the time the second year, and very little the third year. During the last year they frequently become superintendents or inspectors of work.

In order to show the comprehensive char-

acter and thoroughness of the course of study in these colleges, I will give, in some detail, but much more briefly than is the case in the original programme from which I quote, what is taught at Poppelsdorf, which, as I have already said, is one of the leading agricultural institutions of Germany:

A. *Agriculture.*—1. Knowledge of the soil. 2. Study of manures. 3. Clearing, draining and working land. 4. The knowledge of agricultural implements and machines. 5. The cultivation of grain and fodder. 6. The cultivation of materials for manufacturing purposes. 7. The cultivation of grass lands. 8. The cultivation of vines and vegetables. 9. The cultivation of fruit trees.

B. *Cattle Breeding.*—1. The general rearing of animals, race, parentage, climate, etc. 2. The breeding of horned cattle, working, feeding, fattening. 3. The dairy. 4. Horse-breeding, and knowledge of the external parts of horses. 5. Rearing sheep. 6. The knowledge of wools. 7. Rearing smaller animals, pigs, poultry, etc. 8. Sanitary matters connected with the treatment of domestic animals.

C. *Theory of Farming*—1. Principles of political economy involved in rural economy. 2. Systems of farming. 3. Valuation of land and instructions in making estimates of productions. 4. Agricultural book-keeping. 5. Agricultural calculations.

D. *History of Agriculture.*—1. History and Statistics of Agriculture. 2. Literature of Agriculture. 3. Agriculture in different countries.

E. *Forest Economy.*—1. Forest culture. 2. Forest industry, the protection of forests, valuation. 3. Hunting and fishing.

F. *Chemistry* in all its departments.

G. *Physics* in all its departments.

H. *Mineralogy, Geology, Botany, Zoology, Meteorology,* as related to Agriculture.

I. *Mathematics* as applied on the farm.

J. *Political Economy and Jurisprudence,* as related to Agriculture.

K. *Veterinary Science.*

L. *Anatomy* and *Physiology.*

M. The *Architecture* of farm buildings.

This course of study tells its own story, and I need add no comments.

4. *Agricultural Museums.*—I visited a number of these museums in the Old World, and was greatly pleased with them. They are found in connection with general industrial museums, and sometimes at the polytechnic schools and agricultural colleges. The following, from my note-book, will give an idea of what they contain:

1. *Models of buildings on a farm.*—Houses, barns, outbuildings, granaries, dairies, slaughter-houses, farm shops, etc. Drawings. Plans

2. *Pictures of stock of all kinds,* representing different breeds and varieties. Prepared specimens of the heads of cattle, sheep, etc., illustrating breeds. Prepared specimens of poultry of all kinds.

3. *Collections of agricultural implements and machines.*—These are of great extent and variety, such as are in present use contrasted with those used by former generations, hundreds and even thousands of years ago. Models. Drawings.

4. *Farm Products.*—Grains, fruits, vegetables, cotton, silk, tobacco, wines, wools, woods, flax, hemp.

5. *Soils, minerals, plants, animals, insects.*

6. *Fertilizers.*

7. *Natural and artificial anatomical preparations.* 1. Anatomy of the horse, cow, sheep. 2. Diseased parts and organs.

I was so much impressed with the value of these museums that I would be willing to labor long and hard to establish one in our own State. Can it be done?

In conclusion, let me say that public interest in agriculture is by no means confined to this side of the Atlantic. Agricultural fairs are quite as common in the British Islands as they are with us. There are probably one thousand agricultural associations in the German Empire, and those of France number a membership of over a million. Clubs of farmers may be found in almost every considerable town. The Governments of several nations send out agents to visit foreign countries and bring back improved stock, the best kinds of grain and fruits, and such new implements and machinery as they think worthy of trial. Encouragement is given in many places to the holding of winter evening schools for farmers; and courses of lectures on agriculture, by persons deputized by the proper authorities, are of frequent occurrence.

But I must add that, while what has been done for agriculture in Europe has converted many sections into vast gardens, and made them more productive than any other lands on the face of the earth, it must be confessed that a large proportion of the men and women who do the work on the farms remain as stolid and as ignorant as their forefathers could have been a hundred years ago, and continue to use implements of husuandry and modes of culture handed down to them from long by-gone generations. It will require much time and great effort to lift them up to

the level of the working men in this country.

While Europe, therefore, may, in her agricultural progress, occupy in some respects a vantage-ground at the present, America certainly has a brighter prospect for the future.

A MORNING IN QUINCY SCHOOLS.

FIRST LETTER.

SEEING is believing, and although the pamphlet lately published by Mr. Charles Francis Adams on the improvements which three years have made in the Quincy, Mass., school system gives many points for study, the conclusion of the whole matter can best be gained by seeing his results. So a seven thirty-five train carried me out this morning on the Old Colony road to the little town that will have to be rechristened. Indeed, its proper title now is the Mecca of school teachers, for the same morning trains carry out parties of young teachers from Boston, sent out by their school directors to "see into" the new system which is beginning to be established in the primaries of the city; parties of New Yorkers and a few Philadelphians, all bent on "observing," which is the new way invented for teachers to learn.

Arriving at Quincy just as the town clock was striking eight, and there being as yet no local guide book published for the town, I asked the first intelligent porter on the platform which was the way to the primary school, any primary. "That lady will tell you," pointing to a brisk young woman just taking her seat in one of the omnibuses, and who wore a white apron over her alpaca dress and carried an arm-load of books. [The teachers in Quincy, as I learned afterwards, *are* allowed to carry books, if they wish to.] "Yes," she said, on my errand being made known, "she could tell me something about the schools." "Which do you call the best?" "There is no best," said the brisk young woman; "they are all alike. I advise you to go to the Codington school, because it is nearest the station; otherwise I shall be very glad to have you come to mine, but that is quite the farthest off, and something of a drive."

So to the Codington school I went, though it might have been the Washington, or the Wollaston, or any others that were almost as near. The school-house was locked, but there were at least fifty boys playing under the elms and maples, and presently little girls, walking decorously in twos, began to turn into the school enclosure. The boys were driving and tooting all over the yard, and the little girls were exceedingly "proper," which brings its own physiological comment with it.

But there wasn't a school book to be seen. No satchels, no atlases nor books under the arm. You might have thought it was a holiday, but for the appearance of a sweet-eyed young lady, who was introduced by the chorus of boys to me as Miss Morse. To Miss Morse I stated my errand, and she was kind enough to make out a sort of time-table for me, so that I might catch up in the different rooms as much of the day's doings as was possible before the noon bell and the noon train came along. In her room, which was the point of departure for the morning, and still before the nine o'clock bell had rung, I found a pupil teacher looking over the slates of her dictation exercises the day before, not marking the child for errors, but marking the errors for the child.

ABOUT TAKING IN AVERAGES.

On the black-board Miss M. began at once to rub out the synonyms, in common words, that were written up there, and, talking as she wrote, to sprinkle the long black-board with figures. I shall not give my questions, which she was good enough to encourage, but the sum of the answers. They *take* "averages" at the Quincy schools three times a year, of the showing of the class at that time. "I do not take a daily record for averages, but have in mind the general mental condition of each child and its readiness. I don't *crush out* errors in spelling, nor make a culprit of the child who makes mistakes. I try to bring him along with the class. Except for persistent carelessness, there is no writing over as a punishment. Keeping in? We are not *allowed* to keep a child in. Our regular afternoon session is from two to four, and from four to half-past there is a half hour that we take for explanations to bring on a dull child or encourage it. But it is the *class* that must bring him along; class averages are the things to judge by. They learn from each other. Each one wants to be right because his neighbor is. He doesn't like to be behind."

Emulation and not punishment, evidently (I make hasty parenthesis), is the string that is pulled in the Quincy schools. It is only bringing the lessons of after-life into play a little earlier. A man is not "marked" each day, nor does he have time to make up his errors; he must keep up with the rest, or be left behind. Here a small paper of directions was handed to another "pupil teacher," who had come into the room "to observe" for the

first time to-day, in that division. She permitted me to look at it; it ran something like this: "Watch the children. They are as much yours as mine, to-day. Speak to them if they do anything you do not like to see. Look over their slates during the exercises. Find out their names."

THE SCHOOL BELL RINGS.

Just here the great bell rang, a boy seated himself at the old piano, and the classes came filing up stairs to music, forty-five in each division, and six divisions in all. Two pretty little little girls with a small bucket went from desk to desk, wetting all the sponges. There was one colored boy in the line, very well dressed, but apparently not marked among his neighbors in any other way.

"Now, children, get your slates all clean," gave time to settle down a little the spirits brought up from the playground. After a vigorous rubbing, but no noise, the bell tapped and the school exercises began. In a very low voice, "The Lord is my Shepherd" was recited, the teacher leading. Then, still in the same subdued and reverent tones, the Lord's prayer was sung, followed by a pretty childish hymn, and school song. Then holding up his hand, but without any other preface, a boy got up and said, "On my way to school I saw two men digging. What do you suppose it was for?"

(This, the pupil teacher whispered, was the conversation exercise, intended to teach expression and readiness, but also, as it appeared, to use their eyes as they came along to school.) Instantly there was a volley of suggestions, not in disorder, but very much as if on the playground, each child rising, however, to give its opinion. The original boy, however, had to tell them that it was a hole for a flag-pole, and where it was, at Mr. ——'s. Then another boy had seen something else, and another, each little speech beginning with "I saw yesterday," or "last week," or "last summer," and occasionally there was a "long bow" drawn by a fanciful child. But, mostly, the talk was of the village matters.

One boy had information that two vessels out in the bay, two "big steamships," were to be knocked to pieces for their old iron; and, instantly, half the class was on its feet, looking out the windows. (The Quincy school-houses have the advantage of overlooking blue water and the harbor, and the hills in the distance also, which brought up references in another class, as will be seen.) "They are Government vessels," put in another boy, "and they are going to burn them. They are all rotten, too rotten to go to sea." "Little worms," contributed another, "they're all full of little worms in their hulls." "They're going to burn 'em; won't it be fun seeing the fire!" Then there was something said about "Revere beach," and a burned ship that another boy had seen. "Will the iron burn?" asked the teacher. "No; don't you see," explains a young philosopher, "the wood all burns, and the iron falls right into the water and cools off."

It was about a ten minutes' talk in all, the children entirely alert and at their ease, a correction only put in now and then, but entirely in a suggestive way, by the teacher. One notable part of it was that the little girls did not talk. Only one small female, towards the close, ventured a modest observation; but the boys had it all to themselves, as older politicians around the town pump and at the cross-roads store are apt to have.

ORTHOGRAPHY MADE EASY.

At the end of the "conversation," which, with the singing, had occupied just fifteen minutes, the teacher, chalk in hand, stood by the black-board. "What day is this?" "The 30th of September." "Spell *thirty*," and she wrote it according to their direction, putting a twenty under it. "Now, what shall I do to make this *thirtieth* twentieth?" "Rub out the tail of the *y*" directed a child, "dot it for an *i* and then put *e-t-h*." "Is it the same as the *y* when I do that—why don't we keep it *y*?" "Because the long-tail letter doesn't look well—the *i* is better." Following this she wrote "Mister and Mistress Holden were there." "Is that quite right?" "No; you must shorten it." "How? what letters shall I keep?" "Keep the *M* and the *r* and put a dot after the *r*, to show that there is something left out."

Then a child dictated something else for the teacher to write, all the class following on their slates the dictation as they had the previous lines. At the close—pointing to one word after another—"Anybody had '*those*' at all different? Has anybody spelled it another way?" Two or three who had left off the final *e* held up their hands, looking cheerfully corrected, but not ashamed! *Mem:* It is evidently not accounted a *crime* here to make a mistake, and no child is ashamed to acknowledge his, nor tries to conceal it.

Then a curved letter line was drawn; "What am I going to make." It was only

the first part of a *T* in script, but it was made by suggestion into an *A*, an *F*, an *S*, and so on, the children copying. Picking up a slate and holding it up, "Johnny always has such a nice slate, clean and such straight lines." From another slate, writing a crooked letter on the black-board—"What's the matter with this *A*?" Then a small *i* was rapidly changed on the board into many letters, a child pointing out that "you can see he *i* in almost every letter." "All except the *o*," said another. "What's the matter with this *r*?" writing a very tall one on the board. "Too high a hat, more than its half above the line." Teacher, "Clean slates. I am thinking of a nice holiday"—spelling it out on the board—"one of the nicest we have. What is it?" Some voices went up for the Fourth of July, but the majority held it to be Christmas. "It's somebody's birthday." Then it was Christmas—decidedly by acclamation. "Christ's birthday mass." writing it out. "Do we write it that way? No! Why not?" "Ever so many holidays together make a ——?" "Vacation."

"My next word is among those berries on the table," pointing to a vase of bitter-sweet berries, orange and red. "Nice," "elegant," "delicious." "Well—that is to taste. I don't mean to taste;" writing on the board, however, all the suggested words. "Splendid," "pretty." "Yes, that's it. Give me another word for pretty." "Handsome," "beautiful." "You don't sound the *d* in handsome," remarked a youth, holding up his hand as that word was written down. "You don't sound the *t* in vacation, either," remarked another critic, looking at the blackboard and reminded of silent letters. Here a pencil fell. "What was that word?" "Dropped." "Here's the next word," breaking the piece of chalk in half. "Break," "Here's the next," stepping out, "Stepped." All hands, meanwhile, writing very fast, to keep up with the class suggestions and the teacher's action. "If a child came to school after nine oclock we should say he was —?" "Tardy," in a chorus.

A ROYAL ROAD TO GEOGRAPHY.

There was an upper primary class, and leaving that division about to go to arithmetic, I followed my appointed schedule into the lowest grammar class. There, across the blackboard was written. "To swear is neither brave, polite, nor wise," It was the beginning of the geography lesson, subject, North America. On a *blue* board, about a yard square, which had a ledge around it, and was set on table feet, about a dozen children were gathered. In the centre of the board, and heaped up into the rude outline of the continent, was a quantity of earth—iron-moulders' earth—which was brought out with strong relief by the light blue back ground. "Come, Bertie, put in the Rocky Mountains," and a girl began energetically to pinch up a mountain range into peaks like so many small cocoanut cakes. "Jerry, where's Alaska?" Boy pointed to it. "Now go on from there and name me all the land projections around to Florida, noting the indentations."

But after Prince of Wales Point and Point Barrow, Jerry did not know his points very well, and another boy was called up, who traced them all out with small earthy fingers and great enjoyment. It was a new kind of circumnavigation, with the advantage that the navigator, if the class thought a certain point not quiet bold enough, was directed to make it more so, and in the course of the voyage, naming all the points of the Atlantic coast to Florida, there was considerable pulling and pushing up the outline to suit the exacting critics. The "mountain range girl" was all the time building up the several backbones of the Western Continent, and another at work on the table land of Mexico.

Arriving at the isthmus, the sailor was stopped. "How do you get across here—we don't want to go any farther south—can we go by water?" "No." "Not just yet," interposed the visitor; but we were spared the tunnels and traversed the isthmus safely enough by rail at Panama, and got round to the west coast.

Here the coasting finger pointed out the capes and located San Francisco for me. "What's the matter with the eastern part of this continent?" said the teacher, after the bays and gulfs had been successfully visited by another little finger, with the name given at each blue water (blackboard) stopping place.) "What is the matter here?" "No mountains," was the chorus, and Jerry—another Jerry—gets to work on the Alleghanies. The table land complete. "How high is this?" "8000 feet." "How high are the Rocky Mountains? Are they very high towards the north?" "In the west?" "What little range ought to be here?" "Wahsatch Coast Range." "Where is the lowest land along here?" Girl points to Mississippi river. "Why doesn't it wash out over here?" "Levees keep it out." "Why don't all the rivers run out into the Gulf of Mexico? Here are some going over to the Atlantic. What's the trouble up here?"

pointing to the St. Lawrence. "Why doesn't this run down like the Mississippi?" "It couldn't run up a mountain; it *has* to go east." "Why?" "Because of the height of land." "What's that?" Child points out and pats up a height of land, making the Mississippi basin still more a hollow by contrast.

Indeed, the little hands took great engineering delight out of the Mississippi valley. Their heads were clear enough on that point. "Why is the St. Lawrence called so?" "It's named after the day the first people sailed up it, on St. Lawrence's Day." Pointing to Hudson's Bay. "Is that named after a day, too?" "No," in chorus, "after a man, Hendrick Hudson, the man that sailed into it." "How do you know, if you didn't see it, if you only saw a flat map, that there must be a height of land here?" teacher going back by a quick diversion to the former base of operations. "There must be." "Why?" "Because the rivers run north, and if you traveled up them you would notice that." "But here's the Mississippi; *that* goes south." "Well, it flows that way because it *must* slope south; rivers don't run up hill." "I don't see any rivers going east along here," still in the valley of the Ohio. "Oh, *they've* got to go west; they can't get out to the sea because of the Alleghanies."

BOUNDARIES

Were easy, because of the actual ridges of land and the blue board oceans under their hands, and, of course, they were correct. To the minute observation of a child the small ridges and scallops of earth each had its own character, unlike its fellows, and to be named by its own title. "Now make some really good sentences, to give me the boundaries of the Great Central Plain." "It extends from the Rocky Mountains on the west to the Apallachians on the east." "George, why do you say 'it,' instead of the Great Central Plain?" "Don't want to say the same thing twice, and they know you are talking about the *same* thing until you stop." *Mem.* —Miss Morse had said laughingly in answer to my question, "Grammar? there is no grammar taught in town except what comes in with the other lessons;" and here was a specimen of the Quincy way of getting at the pronouns. George goes on with his central plain—"It's pretty abrupt at the foot of the Rocky Mountains, but here it gradually slopes." "What do you mean by gradual?" "A little at a time." Teacher pointing to a Northern river, "What's this?" "Mackenzie." "Going *north?*" "Yes; it *must*, don't you see, because of the height of land."

A little restlessness at one corner of the board. "Here, boys, make an isthmus; and you John, the best range of mountains you can over there." This was *outside* of the map, and was regarded as a telling reproof, the culprits doing their moulding very energetically indeed, from a small heap of the earth that lay in a corner of the board. Coming south to Florida—"What's this?" "A peninsula." "What makes this?" "Coral insects. *An insect spits it out and makes rocks.*" "No—it is a skeleton of an insect, like our bones." "It is an insect's house, and grows red." "It isn't colored by the sailors," one and other of the class remarks. "Now take your slates, and write me out the boundaries of North America."

"Have they any other maps?" I asked. "Some of them have an atlas at home." "But do they learn all these names of capes and bays and mountains 'by ear' around the board?" "Yes, but then they write them out, you know, and that impresses them too. They use their home atlases to draw maps by sometimes. But," smiling, "I have hard work to *keep* my class from copying these drawings on the board," pointing to some landscapes in chalk on a row of black-boards left by the *teachers'* drawing class. "They copy what they see. One teachers' class meets here of an evening for drawing lessons and practice," [all the Massachusetts teachers learn to draw,] "and the drawings are left until the next lesson to *decorate* the rooms." At the end of the geography lesson the two teachers perfected the map, and that was left on the *blue*-board—a sort of billiard geography—until the following day.

"We begin our map work by taking them to the window and telling them to make something like that hill out there," where the Milton Hills lie in the distance. "That does very well for an easy lesson in mountains."

DRILL IN MARCHING.

At the tap of the bell the classes marched out for recess—half-past ten—Miss Dearborn, the head master, inspecting the entire 270 as they passed down the stairs. The marching was *almost* as good as that of the younger boys at the Girard College, also under feminine drill.

"Do you spend any time in musical notation, Miss Dearborn?" "No; they all learn to sing, but we don't give any particular care to the mere notes."

SOME GENERAL REFLECTIONS.

But a word just here, which cannot be too often insisted on. The children in New York and Philadelphia public schools are encouraged to much criticism on each other—criticism on intonations and inflections, and the *machinery* of reading. At Quincy I noticed very little of that. The criticism was of ideas—opinions chiefly. This took off what has always struck me as an unpleasant feature of our system, the sharp, snapping attitude of these little folks toward each other, all on the *qui vive* for another's mistake, and perhaps somewhat disappointed when the paragraph is read through quite smoothly. The questions of the teacher, the comments of the class in every performance in the reading, and history, and the language recitation (quite another matter from the conversation exercise), were directed to substance rather than form, to ideas rather than inflections. The point all through was the meaning, the opinion, the lively remarks of the class. That in itself is a difference strongly marked between this New England school Mecca and any other public school on the continent that it has been my fortune to see.

Cor. Phila. Ledger.

EACH AND ALL.

R. W. EMERSON.

Little thinks, in the field, yon red-cloaked clown
Of thee from the hill-top looking down;
The heifer that lows in the upland farm,
Far-heard, lows not thine ear to charm;
The sexton, tolling his bell at noon,
Deems not that great Napoleon
Stops his horse, and lists with delight,
Whilst his files sweep round yon Alpine height;
Nor knowest thou what argument
Thy life to thy neighbor's creed has lent.
All are needed by each one;
Nothing is fair or good alone.
I thought the sparrow's note from heaven,
Singing at dawn on the alder bough;
I brought him home, in his nest, at even;
He sings the song, but it pleases not now,
For I did not bring home the river and sky;—
He sang to my ear,—they sang to my eye.
The delicate shells lay on the shore;
The bubbles of the latest wave
Fresh pearls to their enamel gave;
And the bellowing of the savage sea
Greeted their safe escape to me.
I wiped away the weeds and foam,
I fetched my sea-born treasures home;
But the poor, unsightly, noisome things
Had left their beauty on the shore,
With the sun and the sand and the wild uproar.
The lover watched his graceful maid,
As mid the virgin train she strayed,
Nor knew her beauty's best attire
Was woven still by the snow-white choir.
At last she came to his hermitage,
Like the bird from the woodlands to the cage;
The gay enchantment was undone,
A gentle wife, but fairy none.
Then I said, "I covet truth;
Beauty is unripe childhood's cheat;
I leave it behind with the games of youth."
As I spoke, beneath my feet
The ground-pine curled its pretty wreath,
Running over the club-moss burs;
I inhaled the violet's breath;
Around me stood the oaks and firs;
Pine cones and acorns lay on the ground;
Over me soared the eternal sky,
Full of light and of deity;
Again I saw, again I heard
The rolling river, the morning bird;
Beauty through my senses stole;
I yielded myself to the perfect whole.

THE AIR AND THE SEA.

M. F. MAURY.

THE atmosphere forms a spherical shell, surrounding the earth to a depth unknown to us, by reason of its growing tenuity, as it is released from the pressure of its own superincumbent mass. Its upper surface cannot be nearer than fifty, and scarcely more remote than five hundred miles. It surrounds us on all sides, yet we see it not; it presses on us with a load of fifteen pounds on every square inch of surface of our bodies, or from seventy to one hundred tons on us in all, yet we do not so much as feel its weight. Softer than the finest down, more impalpable than the finest gossamer, it leaves the cobweb undisturbed, and scarcely stirs the lightest flower that feeds on the dew it supplies; yet it bears the fleets of nations on its wings around the world, and crushes the most refractory substances with its weight. When in motion, its force is sufficient to level with the earth the most stately forests and stable buildings, to raise the waters of the ocean into ridges like mountains, and dash the strongest ships to pieces like toys. It warms and cools by turns the earth and the living creatures that inhabit it. It draws up vapors from the sea and land, retains them dissolved in itself or suspended in cisterns of clouds, and throws them down again as rain or dew, when they are required. It bends the rays of the sun from their path to give us the aurora of the morning and twilight of evening; it disperses and refracts their various tints, to beautify the approach and the retreat of the orb of day. But for the atmosphere, sunshine would burst on us in a moment and fail us in the twinkling of an eye, removing

us in an instant from midnight darkness to the blaze of noon. We should have no twilight to soften and beautify the landscape, no clouds to shade us from the scorching heat; but the bald earth, as it revolved on its axis, would turn its tanned and weakened front to the full unmitigated rays of the lord of day.

The atmosphere affords the gas which vivifies and warms our frames; it receives into itself that which has been polluted by use, and is thrown off as noxious. It feeds the flame of life exactly as it does that of the fire. It is in both cases consumed, in both cases it affords the food of consumption, and in both cases it becomes combined with charcoal, which requires it for combustion, and which removes it when combustion is over. It is the girdling, encircling air that makes the whole world kin. The carbonic acid, with which element our breathing fills the air, to-morrow seeks its way round the world.

The date-trees that grow round the falls of the Nile will drink it in by their leaves; the cedars of Lebanon will take of it to add to their stature; the cocoa nuts of Tahiti will grow rapidly upon it; and the palms and bananas of Japan will change it into flowers The oxygen we are breathing was distilled for us some short time ago by the magnolias of Florida, and the great trees that skirt the Orinoco and the Amazon; the giant rhododendrons of the Himalayas contributed to it, and the roses and myrtles of Cashmere, the cinnamon-tree of Ceylon, and the forest, older than the flood, that lies buried deep in the heart of Africa, far behind the Mountains of the Moon, gave it out. The rain we see descending was thawed for us out of the icebergs which have watched the Polar Star for ages, or it came from snows that rested on the summits of the Alps, but which the lotus lilies have soaked up from the Nile, and exhaled as vapor again into the ever-present air.

There are processes no less interesting going on in other parts of this magnificent field of research. Water is Nature's carrier; with its currents it conveys heat away from the torrid zone and ice from the frigid; or, bottling the caloric away in the vesicles of its vapor, it first makes it impalpable, and then conveys it, by unknown paths, to the most distant parts of the earth. The materials of which the coral builds the island and the nautilus its shell are gathered by this restless leveler from mountains, rocks and valleys in all latitudes. Some it washes down from the Mountains of the Moon, or out of the gold-fields of Australia, or from the mines of Potosi; others from the battle-fields of Europe, or from the marble-quarries of ancient Greece and Rome. These materials, thus collected and carried over falls or down rapids, are transported from river to sea, and delivered by the obedient waters to each insect and to every plant in the ocean, at the right time and temperature, in proper form and in due quantity.

Treating the rocks less gently, it grinds them into dust, or pounds them into sand, or rolls and rubs them until they are fashioned into pebbles, rubble, or boulders; the sand and shingle on the sea-shore are monuments of the abrading, triturating power of water. By water the soil has been brought down from the hills, and spread out into valleys, plains, and fields for man's use. Saving the rocks on which the everlasting hills are established, everything on the surface of our planet seems to have been removed from its original foundation and lodged in its present place by water. Protean in shape, benignant in office, water, whether fresh or salt, solid, fluid or gaseous, is marvelous in its powers. It is one of the chief agents in the manifold workshops in which and by which the earth has been made a habitation fit for man.

PROCRASTINATION.

EDWARD YOUNG.

Be wise to-day; 'tis madness to defer;
Next day the fatal precedent will plead;
Thus on, till wisdom is pushed out of life.
Procrastination is the thief of time;
Year after year it steals, till all are fled,
And to the mercies of a moment leaves
The vast concerns of an eternal scene.
If not so frequent, would not this be strange?
That 'tis so frequent, this is stranger still.

Of man's miraculous mistakes this bears
The palm, "that all men are about to live,"
Forever on the brink of being born;
All pay themselves the compliment to think
They one day shall not drivel, and their pride
On this reversion takes up ready praise;
At least their own; their future selves applaud;
How excellent that life they ne'er will lead!
Time lodged in their own hands is Folly's 'vails;
That lodged in Fate's to wisdom they consign;
The thing they can't but purpose, they postpone.
'Tis not in folly not to scorn a fool,
And scarce in human wisdom to do more.

All promise is poor dilatory man,
And that though every stage. When young, indeed,
In full content we sometimes nobly rest,
Unanxious for ourselves, and only wish,
As duteous sons, our fathers were more wise.
At thirty man suspects himself a fool;
Knows it at forty, and reforms his plan;

At fifty chides his infamous delay,
Pushes his prudent purpose to resolve;
In all the magnanimity of thought,
Resolves, and re resolves; then dies the same.

And why? Because he thinks himself immortal.
All men think all men mortal but themselves;
Themselves, when some alarming shock of fate
Strikes thro' their wounded hearts the sudden dread;
But their hearts wounded, like the wounded air,
Soon close; where passed the shaft no trace is found;
As from the wing no scar the sky retains,
The parted wave no furrow from the keel,
So dies in human hearts the thought of death;
E'en with the tender tear which nature sheds
O'er those we love, we drop it in their grave.

STARS AND STAR GROUPS.

OPENING LECTURES OF WINTER COURSE.

THE opening lectures of the winter course of the Young Men's Christian Association of the city of Lancaster, for the entertainment and instruction of the boys and young men who resort to the reading room, were delivered by Mr. J. P. McCaskey, principal of the Boys' High School, to large audiences of interested listeners. At the first lecture, Mr. S. B. Herr, the General Secretary, made announcement of the course, and cordially invited the regular attendance of all present and their friends, as many as could be admitted to the hall. He also made statement as to the general purposes and work of the Association, showing it, what we have long known it to be, one of the most practical agencies for good that has ever been organized in this city.

Knowing that many readers of *The Journal*, and especially many school teachers, are—*as all should be*—interested in these grand subjects, we transfer to our columns the local newspaper reports of these lectures. These will aid in arousing renewed interest in their own minds, as well as in directing the attention of their more intelligent pupils to the grandest of all material subjects of thought and study. The report of the second lecture will be given in our next issue.

SOLAR AND STELLAR SYSTEMS.

Your Secretary has requested me to say something on the subject of Astronomy. It is not fair to assume that I know more of this grand science than any one may learn in a very short time. Challenging our attention by day and by night, as they do through the round of the year, it would argue rare lack of interest—stupidity, indeed—if everybody did not know at least something of the Sun and the Moon, the planets and the stars. They do say, however, that there is a man near Safe Harbor, and another in Drumore township, who has never learned the North Star! It is possible also that there may be a student at Franklin and Marshall, or at the Normal School at Millersville, who does not know the constellation Orion or the great Dog Star Sirius. But these would seem rare exceptions to the general rule of familiar recognition of leading stars and constellations!

If I could talk to you to-night with the eloquence of the dead Mitchell, this hour would mark an era in the lives of many of you. You would go out from this place intent upon the study of a new science, with an interest aroused that would never fail you in this world or in the next. For there as here we shall, in the sublime words of the astronomer Kepler, "but think the thoughts of God after Him," and surely the grand problems of the universe are fit subjects to engage the attention of immortal beings, whether "here or beyond."

SOLAR SYSTEM IN MINIATURE.

To think intelligently of the stellar system, we must first know what is meant by the solar system. To get this in its relations of distance and magnitude, that is, the relative distances of the planets from each other and from the sun, and then their relative sizes as compared with the sun, let us take an old but simple illustration.

Lancaster is laid out some two miles square. Imagine this a perfect level surface, cleared of everything that can obstruct the view, so that from all parts of this area any object of considerable size may be seen upon it. At the centre, place upon an iron rod, say ten feet in height, a gilt ball two feet in diameter, conspicuous in the sunlight. This will represent the sun, the centre of the system.

Mercury will be a very small grain of shot, gilded, we suppose, which we might see by going close to the slender rod upon the top of which it is placed, at a distance of 82 feet from the central sphere.

Venus would be represented by a pea, at the distance of 142 feet from the sun; the Earth also by a pea, somewhat larger than the last, 215 feet from the sun,—its distance from that luminary being about 92,000,000 of miles and its diameter nearly 8,000 miles. Mars, now shining brilliantly in the east near the Pleiades, at nine o'clock in the evening, would be a pea smaller than either of those already named, its distance 327 feet from the centre, or as far as from the Soldiers' Monument in Centre Square to Hager & Bro's dry-goods store. Then would come the Asteroids, 175 or more, at a distance of from 500 to 600 feet from the centre. These would be grains of sand, and would be passed on West King street before we should reach the Stevens House.

Nearly a quarter of a mile from the starting point—say beyond Mulberry street—we would mount upon its rod the largest of all our planets, a gilt ball the size of an average orange. This would represent Jupiter, now in our southern sky, which is thirteen hundred times the size of the Earth. A smaller orange on its rod two-fifths of a mile from the centre, or near Mary street—continuing our way out West King street—would represent Saturn, a planet also of enormous dimensions, now visible, and which may be readily distinguished by a line drawn diagonally through the Great Square of Pegasus from northwest to southeast, extending the line a short distance in a southeasterly direction. Uranus, which has not been seen by one person in a million without the aid of a telescope, would be a full-sized cherry, three-quarters of a mile from the centre, or in the vicinity of the Watch Factory; while Neptune, never seen without the aid of

the telescope, would be a still larger cherry, placed a mile and a quarter from the centre, or some distance beyond the western limit of the city. So much for relative distances and magnitudes.

THE NEAREST FIXED STAR.

Before leaving this miniature representation of the Solar System, let us note the distances at which upon this scale, the nearest stars would be reached. A few miles beyond Neptune, at most, we may suppose that we should be among them. But no! On we go; soon every planet has disappeared in the distance—past Columbia, Harrisburg, Altoona, Pittsburgh—the nearest star but grows more bright upon our vision, while the sun has shrunk to the proportions of the star—*that is all!* Past Cincinnati, Louisville, St. Louis, Omaha, Salt Lake, across the mountains to San Francisco—and now it blazes bright as Capella or Sirius! Out to sea we go, "following the star," three thousand miles across the Pacific—to the Sandwich Islands—steadily the star gleams before us, brighter than any orb now blazing in our sky, until in mid-ocean, *seventy-five hundred miles* from our starting point, we reach it—*the nearest fixed star!* And this, with Neptune which is nearly 3,000,000,000 miles from the sun brought within a mile and a quarter.

Would we find another and another, distances equally great, or even greater, must be traversed; since our sun itself is but a *star* in the universe of God, and this appalling distance over which we have gone is nothing more nor less than that so often named, but whose awful reach is so little realized—"from star to star." In this view of the subject we see at once that our entire Solar System, vast as it is in its distances and magnitudes, dwindles to a mere star point in the Stellar Universe.

Newcomb, in his latest work, rates the sun as one among a hundred millions of stars. If each of these be attended by its retinue of planets, our system becomes one among a hundred million of solar systems! Well did that great American astronomer, the gifted Mitchell, declare: "The Bible furnishes the only fitting vehicle to express the thoughts that overwhelm us when contemplating the Stellar Universe."

DISTANCES AND MAGNITUDES.

Returning to our Solar System, we find the sun, its mighty centre, a body so vast in size as to transcend all human conception. If our Earth were hurled through one of the sun spots to the centre of its mass, and the moon should follow at its present distance from the Earth, our satellite would be buried out of sight, two hundred thousand miles beneath the sun's glowing surface—its diameter being more than 850,000 miles. Its bulk is sufficient to make nearly a million and a quarter great worlds like ours; and its mass more than six hundred and fifty times that of all the planets put together!

Mercury is the first planet generally recognized as we pass out from the Sun, though it is thought that a smaller planet, which has been named Vulcan, may revolve in an orbit much nearer the sun. The diameter of Mercury is nearly 3000 miles—one third greater than that of our Moon,—and its distance from the sun about thirty-six million miles. It moves in its orbit with a velocity of 105,000 miles per hour, while the velocity of Neptune, the most distant of the planets, is but 12,000 miles. The beautiful planet Venus is distant from the sun sixty-seven million miles, its diameter 7,500 miles.

Next in order is the Earth, 92 millions of miles from the Sun, its diameter nearly 8,000 miles, flying along in its orbit at the rate of 18 miles per second,, and wheeling upon its axis with nearly the same velocity, so that a man upon its surface cannot lift his hat without making quite a trip of it bareheaded. The Earth has a Moon, with which we are all more or less familiar, whose bulk is about one-third that of Mercury, and whose light is 800,000 times less bright than that of the Sun. The trade dollar and the three-cent piece—two coins that nobody cares to have—would represent the relative disks of the Earth and the Moon.

Then comes "the red Mars," its diameter nearly 5,000 miles, its distance from the Sun 140 millions, and its year equal to nearly two of our years. Next are the Asteroids, nearly 200 of which have been discovered. It has been thought that these are parts of a planet wrecked in some mighty convulsion of nature. The first of these toy planets was discovered on the first night of the present century, and was a remarkable confirmation of what is known as Bode's law. This astronomer had observed that if 4 were added to each of the following series of numbers—0, 3, 6, 12, 24, 48, 96, 192, and 384—making the series 4, 7, 13, 16, 28, 52, 100, 196, and 388, the relative distances of the planets from the Sun would be represented. The series held, approximately, for all but "28," the fifth number. Astronomers, thinking there must be a planet here, cast about to find it, and succeeded far beyond their most sanguine expectations.

After the Asteroids comes Jupiter, the largest of the planets. Its diameter is 88,000 miles, and its mean distance from the Sun 476 millions. It may be seen any clear evening, and is the most conspicuous orb now visible in the southern sky. Its year is equal to twelve of ours, that is, it remains one year in each of the twelve signs of the Zodiac, while the Earth passes through one sign each month.

The next planet, Saturn, also visible to-night, in the southeastern sky, is two and a half years in passing through any given sign of the Zodiac, making its year equal to thirty of ours. Its diameter is 78,000 miles, and its mean distance from the Sun 872 millions. While Venus has no moon, the Earth but one, Mars two, both of them very small, Jupiter four, Uranus four or six, and Neptune one or two, Saturn has already eight moons, besides her three rings, which are the raw material for additional moons.

Next in order comes Uranus with a diameter of 33,000 miles, at the distance of 1,750 millions of miles from the Sun. Last of all we have Neptune, 36,000 miles in diameter, and distant 2,750 millions of miles from the mighty centre of life and energy about which it revolves.

VELOCITY OF LIGHT.

Light from the Sun which moves with a velocity of 11,000,000 miles per minute, reaches the Earth in about eight minutes. It requires between four and five hours to reach Neptune from the Sun, so immense is its distance upon the outer confines of our system. Yet when this vast distance is rated at but one and one quarter miles, we have already seen at what an immensely greater distance the *nearest* fixed star is to be found!

To acquire a more definite idea of the distance to the Sun, in terms with which we are more familiar than any that have yet been given, let us suppose Columbus to have taken the cars A. D. 1492, for the Solar depot, instead of the Santa Maria for the Indies. Moving on day and night at the rate of twenty-five miles per hour since that time, he would *still be on*

the way, and would not reach his far-off destination until A. D. 1914, thirty-five years hence!

STARS AND CONSTELLATIONS.

As we came in, this beautiful evening, the Moon shone brightly approaching the full, all the fainter stars obscured by its light. The splendid star Arcturus, known to Job and to generations before and since his time, is sinking in the northwest. Antares, the heart of the Scorpion, in the southwest, is hardly less brilliant.

The Northern Crown follows close upon Arcturus, and immediately after the Scorpion comes Sagittarius, conspicuous for his bow and the prominent Milk Dipper. A part of Ophiuchus and the curving line of the Serpent can be traced in the western sky, from the X-shaped head near the Northern Crown to where the tail passes between the divided streams of the Milky Way.

Nearly overhead, but a little west of the meridian, is the brilliant star Vega, in the Harp, distinguished by a faint parallelogram a short distance from it. Carrying a line towards the south, bearing off in an easterly direction, we distinguish three stars, two or three degrees apart, the middle one being very bright. This is Altair, in the Eagle. East of this we have a parallelogram of faint stars known as Job's Coffin. Continuing the line from Vega through Altair, we reach the stars in the head of Capricornus, the constellation in the Zodiac next after Sagittarius.

Nearly overhead again, but east of the meridian, is the Northern Cross, in the constellation of the Swan. This lies along the Milky Way, and in its proportions is a much better figure than what is known as the Southern Cross—not seen in the Northern Hemisphere. A triangle formed with Vega, Altair and Deneb, in the head of the Cross, will enclose the entire figure.

When we go into the street again this evening, the Great Square of Pegasus will be nearly overhead. This any one can readily distinguish, the figure being almost square, the length of its sides from 12 to 15 degrees. Taking this as a base of operations, a line drawn to the south from the two stars on the western side will strike Fomalhaut, a well-known star of the first magnitude in the Southern Fish. A few degrees west of that line we now see the great planet Jupiter.

A line drawn diagonally through the Square towards the southeast, as has already been said, will indicate Saturn, noted for its moons and rings. A line through the stars on the eastern side of the Square will strike Diphda, a bright star in the constellation of the Whale.

Extend a line diagonally through the Square towards the northeast as far as Capella, a very bright white star now in that quarter of the heavens; it will pass three stars of nearly the same magnitude, two of them in Andromeda and one in Perseus. These are named respectively Mirach, Almaach, and Algenib, the last named being nearest Capella. A bright star off this line to the east makes a right-angled triangle with Almaach and Algenib. This is Algol, the most interesting variable star in the heavens, changing from second to fourth magnitude and back again, once in every three days, these changes taking place within a period of about three hours. It is in the Head of Medusa.

In the eastern sky, we now have the Pleiades, in the constellation Taurus, near which Mars is shining. Nearer the horizon is Aldebaran, a brilliant star in the V-shaped figure of the Hyades.

So it moves on—the splendid procession of the winter constellations. Soon Orion and his Dogs, the Twins, and the Charioteer, will again make the sky of winter resplendent, as they have done for the generations that have come and gone during the past ten thousand years, and as they probably will do for those of the next ten thousand years, with so little change from age to age, that if Job, or Abraham, or David, or the architect of the Great Pyramid, should stand with us to night, they would see and recognize the old familiar constellations, their proportions the same and their relative distances apparently unchanged, despite their enormous velocities, in all these thousands of years!

Mr. McCaskey continued his subject, presenting its strong claims upon the attention of all who are capable of thought or feeling. He called for a show of hands of such as knew the planets, stars, and star groups that had been placed upon the blackboard. A number of High School boys who were present held up their hands, and other hands went up in response to the call for volunteers who were ready to learn them before the time of the next lecture, two weeks hence. The lecturer continued for an hour, or until a quarter past nine o'clock, when those who were especially interested were invited to go out to the corner of Mulberry and Vine streets to identify the stars, planets and constellations named above, and which had been placed upon the board. A goodly number adjourned to the hill, and a profitable half-hour or more was spent in recognizing the leading orbs now visible at nine o'clock in the evening. These lectures promise well for the boys and young men who will attend them. The Secretary has done a good work in planning a course of such practical utility.

NOBLE CONDUCT.

DO UNTO OTHERS AS YOU WOULD HAVE OTHERS DO TO YOU.

SOME years since, a correspondent of the Blair County (Pa.) *Whig* furnished that paper with the particulars of the following interesting incident, of which he was an eye-witness. It occurred years ago on the line of the great internal improvements of the State, and is one of those scenes of genuine kind-heartedness which fill the mind with the involuntary consciousness that there is "something of the angel still in our common nature."

At the point this side of the mountain, where occurred the transhipment of passengers from the West, was moored a canal-boat, awaiting the arrival of the train ere starting on its way through to the East. The captain of the boat, a tall, rough, sun-embrowned man, stood by his craft, superintending the labors of his men, when the cars rolled up, and a few minutes after a party of about half a dozen gentlemen came out, and deliberately walking up to the captain, addressed him something after this wise:

"Sir, we wish to go on east, but our farther progress to-day depends on you. In the cars we have just left a sick man, whose presence is disagreeable. We have been appointed a committee by the passengers to ask that you will deny this man a passage in your boat. If he goes, we remain; what say you?"

"Gentlemen," replied the captain, "I have heard the passengers through their committee. Has the sick man a representative here?"

To this unexpected interrogatory there was no answer; when, without a moment's pause, the captain crossed over to the car, and entering, beheld in one

corner a poor, emaciated, worn-out creature, whose life was nearly eaten up by that canker-worm, consumption. The man's head was bowed in his hands, and he was weeping. The captain advanced and spoke to him kindly.

"Oh! sir," said the shivering invalid, looking up, his face lit with trembling expectations, "are you the captain, and will you take me? God help me! The passengers look upon me as a breathing pestilence, and are so unkind! You see, sir, I am dying; if I am spared to reach my mother, I shall die happy. She lives in Burlington, sir, and my journey is more than half performed. I am a poor painter, and the only child of her in whose arms I wish to die!"

"You shall go," said the captain, "if I lose every other passenger for the trip."

By this time the whole crowd of passengers were grouped around the boat, with their baggage piled on the path, and they themselves awaiting the decision of the captain before engaging their passage.

A moment more and that decision was made known, as they beheld him coming from the cars with the sick man cradled in his arms. Pushing directly through the crowd with his dying burden, he ordered a mattress to be spread in the choicest part of the boat, where he laid the invalid with all the care of a parent. That done, the captain directed the boat to be prepared for starting.

But a new feeling seemed to possess the astonished passengers—that of shame and contrition at their inhumanity. With one common impulse they walked aboard the boat, and in a few hours after, another committee was sent to the captain, entreating his presence among the passengers in the cabin.

He went, and from their midst there arose a white-haired man, who with tear-drops starting in his eyes, told that rough, sun-embrowned man that he had taught them a lesson, that they felt humbled before him, and they asked his forgiveness. It was a touching scene. The fountain of true sympathy was broken up in the heart of nature, and its waters welled up, choking the utterance of all present.

On the instant a purse was made up for the sick man, with a "God speed" on his way home, to die in the arms of his mother.

OPPOSITE EXAMPLES.

HORACE MANN.

I ASK the young man who is just forming his habits of life, or just beginning to indulge those habitual trains of thought out of which habits grow, to look around him, and mark the examples whose fortune he would covet, or whose fate he would abhor. Even as we walk the streets, we meet with exhibitions of each extreme. Here, behold a patriarch, whose stock of vigor three-score years and ten seem hardly to have impaired. His erect form, his firm step, his elastic limbs, and undimmed senses, are so many certificates of good conduct; or rather, so many jewels and orders of nobility with which nature has honored him for his fidelity to her laws. His fair complexion shows that his blood has never been corrupted; his pure breath, that he has never yielded his digestive apparatus to abuse; his exact language and keen apprehension, that his brain has never been drugged or stupefied by the poisons of distiller or tobacconist. Enjoying his appetites to the highest, he has preserved the power of enjoying them. As he drains the cup of life, there are no lees at the bottom. His organs will reach the goal of existence together. Painlessly as a candle burns down in its socket, so will he expire; and a little imagination would convert him into another Enoch, translated from earth to a better world without the sting of death.

But look at an opposite extreme, where an opposite history is recorded. What wreck so shocking to behold as the wreck of a dissolute man;—the vigor of life exhausted, and yet the first steps in an honorable career not taken; in himself a lazar-house of diseases; dead, but, by a heathenish custom of society, unburied! Rogues have had the initial letter of their title burnt into the palms of their hands; even for murder, Cain was only branded on the forehead; but over the whole person of the debauchee or the inebriate, the signatures of infamy are written. How nature brands him with stigma and opprobrium. How she hangs labels all over him, to testify her disgust at his existence, and to admonish others to beware of his example! How she loosens all his joints, sends tremors along his muscles, and bends forward his frame, as if to bring him upon all-fours with kindred brutes, or to degrade him to the reptile's crawling! How she disfigures his countenance, as if intent upon obliterating all traces of her own image, so that she may swear she never made him! How she pours rheum over his eyes, sends foul spirits to inhabit his breath, and shrieks, as with a trumpet, from every pore of his body, "Behold a beast!" Such a man may be seen in the streets of our cities every day; if rich enough, he may be found in the saloons, and at the tables of the "upper ten;" but surely, to every man of purity and honor, to every man whose wisdom as well as whose heart is unblemished, the wretch who comes cropped and bleeding from the pillory, and redolent with its appropriate perfumes, would be a guest or a companion far less offensive and disgusting.

Now let the young man, rejoicing in his manly proportions, and in his comeliness, look on *this* picture, and on *this*, and then say, after the likeness of which model he intends his own erect stature and sublime countenance shall be configured.

CULTURE OF IMAGINATION.

THOMAS HILL, LL.D.

THE exclusion of spelling-books, and the curtailing of the time given to arithmetic and grammar, are reforms imperatively needed for the sake of the children's minds, as well as for making room for geometry, drawing and music. Teaching from spelling-books is one of the most fruitful causes of bad spelling; learning to read, and practice in reading, is the only sure way of learning to spell. Arithmetic would be better learned by the majority of children in New England if it were postponed two or three years later, and only half the time given to it. Grammar, like spelling, is best learned by reading. In the Waltham schools we banished the ordinary readers, and furnished the scholars with the loan of English classics, and spent a great deal of our school time in reading them aloud; English classics, from Mrs. Barbauld's *Hymns in Prose*, and Maria Edgeworth's *Early Lessons*, up to Shakespeare and Milton. Familiarity with these writings gave the power of writing and speaking good English.

The wonderful success of vocal music in the Boston schools shows what can be accomplished by a right method of culture, and by a few minutes' daily attention to one object for a long series of days. The same daily, patient attention to drawing, under a wise and comprehensive system, would give as remarkable and valuable results in that art. And if conjoined with this there should be daily short exercises of other kinds, designed to develop the imagination in space, in other directions, so as to furnish a basis of science as well as for art, there would be equal success there also.

Froebel gives the child certain geometrical solids in wood, as playthings, also blocks and rods, and adds the ingenious device of using soaked peas and pointed rods with which to build skeletons of solids. Afterwards he gives the child wax and clay, with which to model what he pleases. All this is well. The apparatus for illustrating geometrical truths and stimulating the imagination in regard to forms in space may, however, be greatly extended. We used, in the schools of Waltham, the little bricks of Miss Edgeworth; that is, hard pine blocks, two inches by one by one-half, with a sprinkling of half-bricks, and of bricks of double length, and found them to answer an excellent purpose. We also used, with good effect, a simpler form of the Chinese tangrams, consisting of isosceles right triangles, of two sizes, one half the size of the other, with three of which two hundred or more different figures can be made. In private teaching I have used also triangles with curved sides, arcs of 120 and 60 degrees; in one triangle both of the sides of sixty being concave, and in the other, one being convex. With three of these triangles a great variety of figures can be made.

In the higher schools of applied mathematics, it is common to illustrate geometrical surfaces by an arrangement of threads according to fixed laws, giving by their intersection various forms. In such schools the pupils are also taught to reason and demonstrate the properties of the exact surface, rudely sketched by the crossing threads. In schools of a lower grade, also, I see very great advantages in early accustoming the the child to the appearance of similar models; and to the imagination of the perfect form, years before his reasoning powers are sufficiently developed to enable him to demonstrate a single one of its properties. It is no strain upon a child's memory, no premature taxing of his reason, no flight beyond his power of imagination, to show him, for example, that if a hoop roll on the inside of a hoop of double its diameter, each point of that hoop will move back and forth in a straight diameter of the larger hoop; but if the little hoop roll upon the outside of the larger hoop, each point of it moves in a path exactly like the bright cow's foot in a cup of milk. It does not strain any of his powers to show him the shape of the hanging chain, and of the bent rod, and of the path of the flying ball, and to show him their differences and their likenesses.

It lifts him to a perception of the reality and importance of these geometric forms; it stimulates him to keener observation of the diagrams of nature; it awakens in him a longing to know in what manner the properties of these curves are demonstrated; and thus becomes a stimulus to study. These higher geometrical truths act upon the scientific and æsthetic taste of the young, as the occasional reading of the finest poetry acts upon their literary taste; not appreciated at first, they afterward linger in the memory of the growing man, as a guide to higher regions of thought and feeling. They are the trophies of Miltiades, that will not let the young Themistocles sleep.

Independent of all direct or indirect uses, the power of imagination in space is well

worthy of cultivation as a source of the most constant and the purest pleasure to its possessor. That is most useful which contributes most to human virtue and happiness; and I know of no way to contribute to the permanent happiness of a good man more surely, than to train him in early life to the habit of accurate, clear imagination. It is the best and most essential part of that rare and valuable gift,—the power of accurate observation. In mere sense the eagle is incomparably keener-sighted than a man; yet the man who loves nature sees in her face ten thousand times as much as the bird of prey,—

"A lover's eyes will gaze an eagle blind."

It is the foundation of all good workmanship and mechanical invention. Invention is simply the clear, definite imagination of a machine not yet built; good workmanship is but the successful realization of an accurate ideal. Imagination in space is the foundation of all accurate imagination, and lays the corner-stone on which the poet, the novelist, the dramatist, and the orator build. Even the works of these men of genius cannot be appreciated by the hearer or the reader devoid of the power of reproducing the scene or the image in his mind.

And, above all, it is the trained power of imagination in space that lets us into the secret council chambers of nature, and reveals to us the divine pattern on which she builds. To the finite mind there is no power of analyzing space, of recognizing either distance or direction, magnitude or form, until the example is given it in the Creator's works. Taught by an analysis of nature, the human mind learns to invent *a priori* forms, and then discovers that these had been known to God from the beginning, and his works modeled upon them. Thus it learns that geometrical ideas are the eternal archetypes of all that has been created, and that in the investigation of the forms of curves we are permitted to share in the employment of the Divine mind. Hence it is that the geometer receives with such sublime hope and glorious anticipations announcements like that made by Pierce, at Baltimore, in 1858,—that, in a new set of simple curves just discovered, there was employment for the highest mathematical genius, in making only a preliminary examination, to last at least forty thousand million years. Eternity itself cannot exhaust the resources of the Infinite Spirit in the providing of instruction and delight for his children.

The intelligible world is adapted to the intelligent mind. The concrete, particular example, seizing upon the senses and forcing us to notice it, leads to the conception of an abstract, universal truth, and stimulates us to the portrayal in imagination of the consequences which flow from it. This example, or method, of nature is the best guide for the teacher. The child's attention is to be caught by something visible or audible, and he must reproduce it. The earliest drawing should be from a very simple natural object,—say the outline of a leaf. This is to be copied as closely as possible; and for the first lessons, it is manifest that leaves of the simplest outline should be chosen. Afterward, quickness of observation may be taught, and accuracy of memory, tested by exposing the pattern to view for a time (gradually shortened in later lessons), and then put out of sight while the pupil draws from memory.

The weaving of strips of paper into good figures, and of osier-twigs, in the kindergarten manner, may be varied by building with blocks and wooden bricks, playing with dissected maps, tangrams, and other puzzles. Insects, and other animals, sea-shells, acorns, and various objects of natural history, furnish the best models for drawing. Precision may be given to thought and imagination by giving geometrical definitions and propositions without proof.

Colonel Higginson, in his comments on Mrs. Hopkins' Year's Experiment, explains satisfactorily the reason why the school-teacher of routine listens with incredulity to the arguments and statements of those who advocate natural methods of teaching. But I think he takes too desponding a view of the capabilities of the public school. I know that (if we can but get a majority of the school committee and the superintendents of schools in any city to hold rational views persistently for six or eight years consecutively) the four-to-eight-year-olds in the public schools can be trained to enjoy the acquisition of knowledge. I have seen a country school amusing itself at recess with drawing geometrical figures on the sand, and forming diagrams of the twigs of the elm under which they were playing. Their imagination delighted in the generation of curves as much as in fairy tales.

The great reform needed in our public schools is to postpone reasoning to the higher grammar classes and to the high schools, and give attention to the powers of perception and imagination. and the acquisition of skill. It is worse than useless for a

child to explain his arithmetic until he has acquired rapidity and certainty in ciphering; it is worse than useless to study spelling and grammar before the child can read fluently and intelligently. Let the teacher state and solve a question on the blackboard, then state one for the class to solve on their slates. Let the questions require but few figures; better solve ten questions requiring in all four hundred figures, than four questions requiring five hundred figures. Let the teacher read a sentence, then require the child to read it: let the teacher and the class, in concert, read alternate sentences; better thus read three pages, instead of having the pupil stammer and spell out one page.

By this rational method of teaching reading and arithmetic to children under twelve years of age, they become vastly better mathematicians, spellers, readers and writers; I know it by testing it on hundreds of children. Nor is there anything in this inconsistent with the drill of the public school; it has been in public schools that I have seen its successful working. The time thus saved from the ingenious and injurious torture of the spelling book and mental arithmetic, may be advantageously used in the careful cultivation of the powers of observation and imagination. In the very process of saving, you give the pupil more skill and more knowledge of the fundamental arts of using language and using numbers, than is given by the usual modes. *N. E. Journal Education.*

JOHN POUNDS.

THE founder of Ragged Schools was the son of a workman employed in the Royal Dock-yards at Portsmouth, England, and was born in that town in 1766. At the age of fifteen, he met with an accident which crippled him for life. A cobbler by trade, he spent the greater part of his benevolent career in a small workshop, measuring some six feet by eighteen, in St. Mary street, Portsmouth, where he might be seen day after day, seated on his stool, mending shoes, and attending at the same time to the studies of a busy crowd of ragged children, clustering around him. In addition to mental instruction, he gave them industrial training, and taught them to cook their own victuals and mend their own shoes. He was unusually fond of all kinds of birds and domestic animals, and amused himself with rearing singing-birds, jays and parrots, which he trained to live harmoniously with his cats and guinea-pigs. Sometimes he might be seen, seated in the midst of his school, with a canary-bird perched on one shoulder, and a cat on the other. But he was too poor to be able long to indulge in all his benevolent fancies. When his scholars became numerous, he gave up his cats and canary-birds, and devoted the latter part of his life exclusively to the more intellectual employment of taming and subduing the "wild Arabs of the city." How applicable to him the immortal lines of Coleridge:

He prayeth well, who loveth well
All things, both great and small—
He prayeth best, who loveth best
Both man, and bird, and beast;
For the dear God, who loveth us,
He made and loveth all.

The candidates for admission to John Pounds' school were always very numerous. But he invariably gave preference to the worst as well as the poorest children—to the "little blackguards," as he called them. He used to follow them to the quay, and offer them the bribe of a roasted potato, if they would come to his school. Well was he repaid for his unwearied labors by the love and affection which these children bore to him! It is said that John Pounds' Ragged School had the following origin: In early life he adopted a young nephew of his own, whom, poor as he was, he afterwards established comfortably in the world. He thought he could educate him better with a companion than alone, and accordingly enlisted in his service the son of a poor woman. Then another and another child was added, until at last he collected around him a large school of boys and girls. During the latter years of his life, he had no less than forty scholars. He died on the 1st of January, 1839, aged 72. There was much sorrow and weeping in Portsmouth. The children had lost at once their father, and best friend, and most amusing playfellow—Portsmouth had lost one of her noblest ornaments—England one of her most illustrious patriots. We rejoice to think that many who never before heard of John Pounds, will, through Mr. Guthrie's "Second Plea," become acquainted with him. How beautiful is the following tribute to his memory:

"Were we," says Mr. Guthrie, "to make a pilgrimage anywhere, as soon as to the lowly heath where the martyr reposes, we would direct our steps to the busy streets of Portsmouth, and turning aside from the proud array of England's floating bulwarks, we would seek out the humble shop where John Pounds achieved his work of mercy, and earned an

imperishable fame. There is no poetry in his name, and none in his profession; but there was more than poetry—the highest, noblest piety—in his life. Every day within his shop he might be seen cobbling shoes, and surrounded by some score or two of ragged urchins, whom he was converting into useful members of the State. Honor to the memory of the patriot cobbler, beneath whose leather apron there beat the kindest heart—there glowed a bosom fired with the noblest ambition; and who without fee from scholar or reward from man, while he toiled for his hard earned bread with the sweat of his brow, educated not less than five hundred outcasts, before they laid him in the lowly grave. Honor, we say again, to the memory of this illustrious patriot! Nor is there in all the world any sight we would have traveled so far or so soon to see, as that self-same man, when he followed some ragged boy along the quays of Portsmouth, keeping his kind, keen eye upon him, and tempting the young savage to his school with the bribe of a smoking potato. Princes and peers, judges and divines, might have stood uncovered in his presence; and many marble monuments might be removed from the venerable walls of Westminster—poets, warriors and statesmen might give place—to make room for him."

THE SOCIAL SCIENCE ASSOCIATION AT SARATOGA.

PAPERS ON EDUCATION.

THE American Social Science Association held its annual session at Saratoga, during the week commencing September 8th. Education seems to have been the most prominent topic brought before the Association, and some of the papers read on this subject are of great value. We give below full extracts from the able address of President Porter, of Yale College, and shorter ones from the addresses of others. Our readers will find in all rich food for thought. For the matter we present we are indebted to the report of the New York *Tribune*.

PRESIDENT PORTER'S ADDRESS.

My theme is Modern Education in the three aspects of Research, Exposition, and Examination—or the Modern Instructor as a Student, a Teacher, and an Examiner of the work of his pupils. I begin with the teacher as himself a learner, or education as involving research. A little reflection or a very little practice will convince the most skeptical that the teacher needs not only to learn what he desires to impart, but also how he may communicate it with the best success. Research in Education covers both these points.

No one will question that the teacher ought to know something more than his pupils. Exactly how much, it is not always easy to decide. The doctrine now prevails, and in general should be accepted as true, that the more a teacher knows and has thought upon any subject, the more successfully will he communicate to one who has learned and reflected less than himself. Nevertheless, the consummate philosopher does not always prove to be the most successful defender and expounder even of his own theories, and the clearest and most logical thinkers are by no means uniformly the best teachers. Why this should be we have not far to seek. The accomplished philosopher too often measures the capacities of his pupil by his own. He is of all men the most incapable of appreciating the fickleness of the attention of the pupil, the feebleness of his memory and the narrowness of his intelligence. His pupil may be slow to apprehend simply because the facts are unfamiliar and the powers of attention are unformed. The philosopher too often begins with the remote and general, which he fails to justify and illustrate by the familiar and the incidental. He forgets that the learner must invariably move from the individual to the general, from facts to principles, from examples to truths, and that he must first make his way from starting post to goal before he can return from goal to starting-post.

We grant that the philosopher is in no sense disqualified for success as a teacher, simply because he is a philosopher. But we cannot overlook that he is often eminently unsuccessful because he fails to distinguish the order of reflection upon knowledge when it has been gained, and the order of imparting information and exciting thought in one who has never reflected. Failures of this sort are by no means confined to teachers by profession. They are observed in lawyers and preachers, in essayists and critics, in conversation and harangues—among those trained in the schools and those schooled only by life.

One of the great perils of our modern education is that in aiming to be too scientific in form it fails often to be scientific in fact. Many of our elementary textbooks are striking examples of this truth. The attempt to teach the alphabet after what is called a truly scientific method is an example. The devices by which the paradigms of noun and verb are built up on scientific principles for beginners in many of our best grammars of Greek and Latin and the syntax of the sentence, as expounded after some metaphysical theory, are also illustrations. It cannot be denied that to too many pupils the mysteries of the parsing of our sweet English tongue seem awful and recondite.

RESEARCH WITHOUT INSTRUCTION.

It is urged by many that in the higher institutions the most gifted men should be assigned to the special service of scientific investigation and research, and be excused from any considerable service in instruction. The ideal university, it is contended, is pre-eminently a school for investigation and research, in which the teachers should occupy a place altogether subordinate to the men of research. We do not object to the endowment for the sake of research, in institutions especially founded for such a service, of observatories, museums, bureaus of single departments of science, libraries, and societies of literature. But for a university whose function is to educate, nothing could be more unfortunate than the endowment of chairs for research alone with limited obligations to give instruc-

tion. Experience is certainly against this theory. The fitful and in general the scanty productiveness of the life fellowships in the English universities is strikingly contrasted with the astonishing scientific activity of multitudes of poorly paid German professors. The recent revival of scientific activity among the Fellows at Oxford and Cambridge has been largely stimulated, if not almost re-created by influences from without, notably from Germany, and by an active and unceasing demand for more varied and profound instruction in the new learning and science, within and without the university halls. The ardor of pupils eager to learn, which has been aroused by the erudition, speculation, and science that are everywhere fermenting in the thinking world, has passed from the reading class to tutor, from the common-room to the study. It has awakened the sleepy dons to the necessity of research, if they would face their pupils with comfort and answer their many new and puzzling questions. The testimony of Professors Tyndall and Huxley, who are alike eminent as investigators and expounders of science, is emphatic in support of the opinion that science itself will gain more in the quality of its work of research and in the value of its results by a close and active contact with living pupils than it need lose by the distraction of its attention or the lowering of its enthusiasm. The examples of Professors Agassiz and Henry are decisive to the conclusion that men born with a genius for discovery and impelled by an irresistible passion for research are capable of equal delight and eminent success in the work of instruction.

There is danger that the man of research, who is nothing else, will give himself to a single department of thought, and have neither eyes nor ears nor thought for the facts and truths which lie beyond his horizon. It is well for science itself, that when one of its devotees is inclined to shut himself up in the narrow cave of his own studies and now and then pay unlawful honors to the idols which are hidden there, that he should be forced to bring his theories into the light of common day by attempting to teach them to others. Many an extravagant hypothesis might have been nipped in the bud, had its romantic originator been forced to state and defend it before the scrutinizing judgment of a class-room of not over reverential youth. We do neither dishonor the eminent abilities nor the actual services of either Mr. Darwin or Mr. Herbert Spencer when we express the opinion that they would have rendered far more valuable services to science had their activities in research been arrested by constant challenging from slow-minded and critical pupils. Whatever may have been true in the past, it is certain that science must fail of a healthy life unless its duties maintain a close and constant sympathy with the intellectual life of the on-coming generation, as represented in our higher schools.

We conclude, then, that as far as education is concerned with research, it cannot be too scientific, provided the attention of the teacher is wisely distributed between the matter taught and the method of imparting it. Herein lies the promise and the opportunity of our modern education. Its peril is found in the danger of mistaking the scientific in form for the scientific in fact. The danger is almost equal of overlooking the laws under which the youth can be developed to scientific growth, and of the withdrawal of men of scientific genius from the work of teaching.

We have already anticipated our second topic and passed from Research to Exposition or Instruction. That this last is the most important element will be generally accepted. In the old times, the living teacher was held to be essential, when printed books were unknown or rare and costly. In modern times, the variety of books and illustrations has made the occasion less imperative for a teacher's services. But even now the living teacher is always preferred and often required, and for the following reasons:

I. He is needed to instruct the student as to the knowledge which is accepted and established. He cannot escape the fact nor the necessity that teaching must at least begin with authority on the one side and with confidence on the other. In former times, when everything taught was unquestioned, the duty of the teacher was simple. He needed only to repeat what the church or the philosopher affirmed, and his task was achieved. But who in these times shall say what is fixed or received? Or who shall venture to predict what will continue to be established in the next generation? When everything be questioned, even whether there be teacher or pupils, or whether they belong to the same species or acknowledge the same intellectual laws, or have a real or permanent existence, the trials of teachers and pupils are manifold. When mathematical axioms are questioned, and the possible emergence of new relations of space and number is allowed by high mathematical authority, it would seem that neither personal convictions nor self-evident truths can be the ground of authoritative declaration. The ardent and hopeful instructor is tempted to anticipate as true some paradox which he thinks the next sixty years may possibly discover to be true, in order that he may be abreast with the advancing wave of science.

The perils of instruction from these influences are serious and manifold. Even in pure science, instruction lacks positiveness, sharpness and logical coherence, which are ill supplied by dogmatism, conjecture, and romancing. Much more serious are the perils and difficulties which are encountered when the subject-matter concerns directly or remotely the interests and the duties of men, or their hereditary faiths and historic traditions. If the conclusions of science or the discoveries of criticism seem to disturb the sacredness of duty, the authority of law, the permanence of property, the purity of the family, the holiness of worship and the steadfastness of faith, the conflict is perplexing to every conscientious and truth-loving teacher. He asks, What can I, what dare I, teach as true or assert with the authority of personal conviction? The question is still more perplexing when the teacher represents the State, and the inquiry is no longer what the instructor may propound as his individual belief, but what he may declare on the authority of the commonwealth to be true in history, in science and ethics, consistently with the freedom of individual convictions or without violence to religious traditions. From these perils the modern teacher can find no deliverance, nor can the modern State, except by a more positive recognition of the practical, or what is sometimes called the sentimental side of scientific theories as a guide to faith and a limit to license of speculation, than is allowed in many circles.

This subject has recently forced itself upon the attention of scientists of high authority in German university life, in an active controversy between Professors Virchow and Haeckel. The threatened application of what are conceived to be purely scientific theories of physiology and palæontology, of psychology and ethics, of jurisprudence and politics, to the denial or destruction of all that is most valuable in modern

civilization, has distinctly raised the question in scientific circles, when and in what sense can a speculative theory, which is capable of a hazardous application be said to be established in such a sense as to be taught by the authority of the professors of science under the protection of the State. In this country we are happily exempt from the necessity of meeting this question in respect to university education, by the circumstance that the State undertakes to administer this education only to a limited extent. It remains to be seen whether it will not seriously interfere with the administration of any education by the State except that which is strictly elementary and secular, and whether even in this sphere the necessity of teaching with authority will not always create serious difficulty. Notwithstanding whatever may be the speculative or practical difficulties, the principle remains unshaken that the living teacher, to teach with effect, must teach with authority.

INDIVIDUALITY OF THE TEACHER.

II. The living teacher is needed to impart the truth as it is shaped and colored by his individuality. Every man who would teach his fellow-man must meet him as a person, and it is through his personality that he can impart what he has to give. Even in setting forth the most abstract truth, he cannot lay aside his individual methods of conceiving and presenting it. It must be approached from his own view and arranged in an order peculiar to himself. It must be made fresh and living by illustrations drawn from his personal life, and be warmed by the fervor and sympathy which spring from his own heart. At the same time we cannot overlook another fact as patent, namely, that modern teaching with its peculiar and undeniable excellencies, has done much to weaken or to eliminate the personal element, and tends strongly to proceed further in this direction.

Most of all is the living teacher required, that he may adapt his instructions to the individual capacities and temper of his pupils. The ideal conception of the teacher not only requires that he be a man who teaches what he believes and knows, after the manner in which he has learned or holds it, but preëminently that he should study the capacity of each pupil to receive what he can give, adapting it to his individual genius and temper. * * * That the tendencies of modern education set strongly toward overlooking the individual in the class will be denied by few. The influences which tempt the teacher to sacrifice his own individuality to the behest of what he calls scientific method, lead him more remorselessly to sacrifice to the spirit of a system, or his own private convenience, the individual aptitudes and capacities of his pupils.

EXAMINING THE WORK OF THE PUPILS.

III. Office of the teacher—the examination of the work of the pupils. Under this title we include every form and method in which the pupil can be required to reproduce what he has learned, whether it be more than once in a day or only once in a term or a year, whether with the sharp conciseness of an oral reply to a question or the fullness of an oral discourse, or the deliberateness of a written disquisition. That examinations or their equivalent are indispensable to enable the teacher to adapt his teachings to the capacities of his pupils is too obvious to need any enforcement. That the pupil needs to acquire under the stimulus that comes from knowing that he must retain what he receives and reproduce it when called for, is self-evident. That these examinations should be frequent and varied in form and thoroughness ought to be equally obvious. That the teacher is at liberty to make a record of his pupil's performances, if he can do so without hindering his own freedom in teaching, is self-evident. This is the origin as it is also the history of the so-called "recitation," a word peculiar to this country in that special sense. The exercise itself is the natural, if not the necessary, outgrowth from the original and the best method of teaching by conversation; as when Socrates first caught and cornered and then alternately fascinated and tantalized any young man on whom he fixed his eye in the streets or market-places of Athens, or when Plato, in asking or answering his own questions, soared into those flights of mythological wisdom which his auditors could not and would not restrain, or as when Aristotle subjected the pupils with whom he walked up and down to a sharp fire of cross-questioning.

Whatever be the form or the appliances of the examination, its theory is the same, and that is that the learner is bound to make what he has heard or read so far his own that he can explain or reproduce it in his own language and after his own method. It is one of the improvements of modern education that it lays a greater stress than formerly upon every species of examination. The forms of examinations have been varied Their severity has been increased. Greater importance has been attached to them as tests of scholarship, as avenues to offices, honors, and salaries. Much good has come of all this, but the good has not been without alloy.

One abuse has been a tendency and desire to sink the teacher in the examiner. The teacher, who should be the friendly assistant and guide of the pupil, sometimes assumes the place of a suspicious antagonist, who watches his victim with a distrustful eye, springs upon him an unexpected question in order to test his absolute thoroughness, or poses him with some single inquiry or problem, which he knows will baffle all except the leader of the class. Another abuse is the substitution of occasional and infrequent examinations, usually written, for those which are stated and frequent. The advantages of written examinations are important, but to make these the substitute for the frequent and familiar exhibitions of the pupil's power and attainments to the scrutiny of the teacher, with the opportunity afforded the teacher to meet his weakness or strength with help or sympathy, is to limit the teacher's usefulness more than half, and to test the imperfect work of growing boys by trials that are suitable only for full-grown men. The work of the teacher is to stimulate and enrich the minds of others. It should not be his aim to be known as a sharp critic or an acute and merciless examiner, except so far as his acuteness and vigor further the great end of his profession. For this end no labor should be spared. To the promotion of this every needed sacrifice should be made. The office of a teacher should foster rather than suppress an active personal interest in his pupils. It requires that he should interpret individual capacity and attainments by trivial indications, and that he be ready to give friendly aid and counsel to those whose work he condemns.

A very serious objection to an excessive reliance on infrequent examinations, whether oral or written, is that they tempt to the neglect of constant work, weaken the sense of daily responsibility and foster the habit of "cramming." We cannot doubt that whenever the chief interest of school or college life is con-

centrated upon the monthly or even the fortnightly examination, the labors of the ordinary student will become fitful and his habits of study and honest work will be weakened.

PRESIDENT BARNARD ON DEGREES.

LIFTING FROM THE MIRE.

The Regulation and Control of the Degree-conferring Power in American Colleges formed the subject of a paper by President Barnard. The following is a synopsis:

He discussed the extraordinary multiplication of institutions exercising the powers of universities which has taken place in this country within the present century, and gave the results of a laborious investigation as to the number of these institutions and the number of candidates for the degree of Bachelor of Arts in them. Since 1830 the population of the country has increased fourfold, the number of colleges threefold, and the number of students twofold. The average attendance in 1830 was sixty-seven, in 1870 forty-four, and in 1879 about forty. President Barnard thought the point well established that the excessive multiplication of colleges in the United States during the last half century had not been owing to any educational want previously ascertained or subsequently proved to exist. Had this been true, the increase in the total number of undergraduate students would have been proportionately in excess of the increase of population, instead of far behind it, as it has been in fact; and the average attendance on the colleges would have been greater in the later years than in the earlier, instead of being materially lessened, as it is in fact.

If the multitude of superfluous collegiate institutions were deprived of the degree-conferring power, he said, they would do no harm, and might, perhaps, do some good. France, Germany, Italy, and other countries of Continental Europe, are full of lycées, gymnasia, and colleges, where instruction in all branches is as extensive as in the average American college, and generally a great deal more thorough, but which are without power to confer degrees. The British colleges cannot confer degrees, not even those which form a part of the great Universities of Oxford and Cambridge themselves. All England, with a population of 23,000,000, has only four universities; the State of Ohio, with 3,000,000 population, has thirty seven. All France, with a population of 36,000,000, has only fifteen universities, which, moreover, are actually branches of a single one. Germany, with a population of 42,000,000, has only twenty-two universities, or one to 2,000,000 of inhabitants. All Europe, with a population of 300,000,000, has only 101 universities, or one to 3,000,000 people. Our own country, with a population of 45,000,000, has 425 universities, or one to every 100,000 people.

Everywhere but in the United States it has been the policy of governments to proceed with great caution in their concession of the degree-conferring power, and not to concede such power at all unless accompanied with ample provision to sustain it respectably, or unless satisfactorily assured that such provision exists. For a university, in a proper sense of the word, is a costly establishment. It cannot be created by a mere act of Legislature. A fiat university is worth no more than a fiat dollar. We have some universities in this country whose resources are in some degree correspondent to their responsibilities; but we have not one whose power of usefulness is not constantly held in check by insufficiency of means.

After considering the discredit into which the diploma of the average American university is falling, President Barnard proceeded to the discussion of remedies for these evils. He had examined the question whether it is not possible legally to subject the degree-conferring power to such regulation and control as to secure for every degree conferred a voucher of recognized authority, apart from and independent of the institution conferring it. He thought it possible in New York, and suggested giving the Regents of the University of the State the power to confer degrees in Arts (they already have the power to confer degrees in Law, Medicine, and Theology); the Regents should appoint a permanent board of examiners, by whom all candidates for degrees in Arts in any college in the State should be examined, and without whose favorable report no candidate should receive a degree. President Barnard said he did not propose this for New York, because New York needed a remedy for the evils which had been considered, but because the example would probably be very influential, and because the machinery for the system is already at hand in New York. To accomplish the object desired, the system should be universal. As this would be a work of time, however, he mentioned with favor a suggestion by President Gilman that something in the same direction might possibly be accomplished, independently of legislation, by the voluntary association and co-operation of colleges themselves.

WOMEN VOTING IN SCHOOL ELECTIONS.

Professor A. P. Peabody, of Harvard University, read a paper on the "Voting of Women in School Elections." In this address he said:

Women should vote and hold office in school matters, because they in general far surpass men in educational ability, tact, experience, knowledge, and wisdom. Every mother worthy of the name is an educator. Men bear a comparatively small part in the training of their own children. The child's first lessons are at his mother's knee. She understands child nature, and is conversant with the avenues to the child's mind and heart.

When our public schools came into being they were not meant for girls, the education of women being regarded as of little consequence. The schools were then properly, necessarily, under the charge of men. Now that women are men's peers, and more, as to culture, and receive this culture chiefly at the public charge, there remains no reason why they should not render to the public the reciprocal service of control, care, and government in the educational system of which they have become the most favored beneficiaries.

ADDRESS OF PRESIDENT GILMAN.

In the evening, President Gilman delivered his annual address. His subject was "American Education during the Last Decade." It was not a statistical or historical review, but a consideration of the tendencies of the last ten years, and a statement of some of the discussions which have been in progress. After outlining his theme and his method of treating it, he turned aside for a moment to pay a tribute to the memory of two early officers of the association, Dr. Francis Lieber and Dr. Samuel G. Howe. The relation of education to other social forces was then briefly considered, and the basis for a decennial review was glanced at. The following is an abstract of the address:

The common schools were taken up and the various

evidences of their success, and also the fundamental and the incidental criticisms which they have drawn out were concisely enumerated, the speaker taking the ground that, as a whole, the American system never stood so firm nor worked so well as now.

The two lines of attack upon the common schools from ecclesiastical and financial objections were referred to. New York, Cincinnati and New Haven were among the most noteworthy battle-fields where within a decade the religious cry has been heard. Among them all, the New Haven story was most remarkable. Some persons who know the extent of municipal extravagance, and feel the burdens of unjust taxation, have directed the economical knife first of all to the excision of high schools and normal schools, and then to the prohibition of all studies not strictly fundamental, thus bringing on discussions which were wholesome, if not pleasant, and which led the school authorities on the one hand to stricter economy, and the taxpayers on the other hand to wiser liberality, because both came to a more accurate estimate of the American system of public instruction, its opportunities and perils. Besides these fundamental criticisms —that our system of public schools is "godless" and too costly—there are minor criticisms made by friends who seek improvement. There is a general call for a more thorough system of inspection and for better systems of examination. Regrets are heard that in many parts of the country there is so slight a connection between the common schools and the higher institutions of learning. The complaint is made by President F. A. P. Barnard that teachers are most inadequately paid, and by Mr. Philbrick that their tenure of office is too brief. Mr. Edward Atkinson points out the defect that, as a general rule, not even elementary instruction is given in the simplest principles that underlie the social order of the State and of the Nation. Instruction in handicrafts is advocated by the State Superintendent in Maryland.

The most noteworthy administrative change of the decade has been the admission of women to the local school boards in Massachusetts, and the opportunity afforded them in the same State to vote for school officers. The most noteworthy pedagogical movement has been in the introduction of kindergartens, and in the attention bestowed upon drawing and vocal music.

When we look from the primary to the "upper schools," as Dr. McCosh has called them in a recent paper, we discover that there is a general demand for a more regular and systematic connection between them than now exists between the primary school and the college. President Porter, like Dr. McCosh, has repeatedly and eloquently discussed this need. We have in most of our States no organization to be compared with that of the German gymnasia, or the French lycées, or even the English public schools.

PROGRESS OF THE COLLEGES.

Our colleges have made great progress within the last few years, most obviously in their buildings, but also in their collections of books and apparatus, and in their plans of study. There has been a remarkable advance in college architecture, from Cambridge to Berkeley. Remarkable changes have been made in the course of study and in the enforcement of discipline. Cornell University, under President White, began upon a liberal plan, not unlike that of the University of Virginia some forty years before. The under graduate department of Harvard College has been almost transformed under President Eliot, into a Faculty of Philosophy, as understood in Germany, with its amplitude of freedom. Yale College has in name at least subordinated the old academic department to the more comprehensive Faculty of Philosophy and the Arts, of which the scientific school was the nucleus. The University of Michigan has done away with the class system. At Columbia eclectic courses are proposed. The new foundation at Baltimore began on a free plan.

These are but examples of a tendency, generally recognized throughout the country, to offer a choice of several courses instead of a curriculum for the Bachelor's degree. The change is costly, requiring more teachers and more halls, but the gain is undeniable. Indeed, some modification of the traditional college course has been required by the advanced age of the students at admission. The average age of admission at Harvard is eighteen years and five months. After seventeen or eighteen years marked aversions and proclivities are developed in students. Moreover, the multiplicity of subjects to be taught in a college is so great that they cannot be well taught to all scholars. "The principle of eclectic study," says President Barnard, "is the key which solves the whole difficulty."

NOTHING BUT BOYS.

AT an exhibition where mechanical models were a specialty, an old bachelor was showing a cunningly-contrived railroad-switch, containing—as most newly invented railroad-switches do — several features altogether different from other switches. It was evident that he was a bachelor from the way in which he treated six small boys who had wormed themselves into the front rank of spectators. Regarding them with scorn, he pettishly told them to get out of the way and let the ladies and gentlemen see the switch. By his tone and manner he intimated that if his switch were of the variety usually applied to boys, instead of that which is more at home in its railroad connections, they would be treated to a taste of it as well as a sight. The six lads, who happened to be well-behaved little fellows, humbly did as they were bid, and slid around a corner where the bachelor would not be annoyed by their presence.

But it was a disappointment to them to be deprived of seeing the switch and the pretty little model engine which was running over it. So, as there was an abundance of room for them without molesting any of the other spectators of the model, a fatherly old gentleman who took pity on them, called them back and told them to take a square look at all they wanted to see. Then he showed them how the thing worked, and the whole party of lads gave close attention with eyes and ears. Perhaps they did not, when they left, know as much about the apparatus as the man did who contrived it, but they knew something. They

had taken an interest in it, and they had found a man who took an interest in them.

Furthermore, the fatherly man pointed out to the unwise bachelor the folly of snubbing these lads or of pushing them into the background, and reminded him that he stood in the presence of six possible railroad presidents, capitalists, or financiers. At first the bachelor was disposed to sneer at this presentation of possibilities. But when he stopped to think upon it, it seemed reasonable enough, and he acted as if a novel idea, which had never before struck him, was now burrowing into his brain. Before the interview was over he and the boys were tolerably good friends, and when it closed he actually invited them to call again. It was a new experience for him. He could never have been a boy himself. He looked as if he had been brought into the world a ready-made and dried-up little old bachelor, with no sympathy for a boy and no comprehension of a boy's nature and possibilities.

If there is anybody on earth who ought to have a fair chance to look at something which somebody has made, it is the bright and inquiring boy. In the boy we find material for the coming business man. If the railroad presidents of the future, and the bankers and merchants and inventors and all those people are not to come from among our boys, pray tell us whence they shall be furnished. Austere critics of troublesome youth may tell us that the boy is learning his lessons at school, or ought to be, and that he had better not waste his time in giving heed to the jimcrack novelties of addle pated inventors. To which it may wisely be replied that the boy's school, instead of being limited to the place where he pores over his books and says his lessons, is as large as all out of doors. Whatever concerns the welfare or progress of the human race has a particular interest for the boy. While the boy's sister may find scope for her genius in pie, pudding, piano, or pull-back skirt, the area for the boy's exercise of ingenuity embraces everything and knows no bounds.

If the austere and unreasonable persons who crowd boys into the corner and push them out of sight and repress their inquiring dispositions, would occasionally take the trouble to make the acquaintance of some really live specimen of boy, and talk to him, the result might be exceedingly felicitous. Unexpected discoveries in boy nature might be made, which could not fail to prove mutually advantageous. Some people are hard on boys because they consider the boys a nuisance. Others are terribly afraid the youngsters will ask them some questions which they cannot answer. Hence they are afraid. The people and their boys should be on such terms as never to be afraid of each other.

Phila. Times.

OUTLINE OF INSTITUTE WORK.

FOR USE OF INSTITUTE INSTRUCTORS IN MICHIGAN.

THE Superintendent of Public Instruction of Michigan, Hon. C. A. Gower, has published an "Outline of Institute Work for the Use of Instructors in the Michigan Teachers' Institutes." It is a pamphlet of forty open pages, compiled by "twenty of the most experienced and successful institute workers of the State."

Its contents consists of an outline, a series of points which, it is thought, should be discussed at teachers' institutes under the following heads: Organization of District Schools, School Government and Discipline, Arithmetic, Geography, Physiology and Hygiene, United States History, Civil Government, Penmanship, Elementary Drawing, Vocal Music, Morals and Manners, the Art of Questioning, Common Errors in Teaching, Relations of Teacher and Parent, Elementary Sounds, Spelling, Reading, Language Lessons, Grammar, and School Law. The plan contemplates work for two weeks.

Sixteen of the twenty "outlines" are given herewith in almost complete form. They comprise more than three-fourths of the pamphlet, so that the teachers of Pennsylvania who read *The Journal* may have before them, in brief, the line of thought to be pursued on all the leading common school subjects presented before the teachers' institutes of the State of Michigan during the present season. These are solid, common-sense paragraphs, the result of much thought, observation and experience, and we have no word of apology for the length of this most valuable article.

OBJECTS.—The objects of teachers' institutues are to draw into the service of the schools of the State its best educational men, and thereby to train up good common school teachers by giving them a knowledge of the principles underlying their profession, and of the best methods of applying these principles; by promoting acquaintance and professional spirit among teachers, and showing, by practical examples, how vastly good teachers differ from poor ones.

HINTS.—It should be remembered that the institute is a school, and not a *debating* society. Any interruption of an instructor during an exercise, by questions, is to be guarded against by a fixed time for answering legitimate questions. Members, without being urged, should enter into all exercises, take criticism good naturedly, work with spirit, and be companionable. They should, as far as possible, make themselves

agreeable in the families in which they stop, both for their own sakes and the sake of the cause. Members should show that they *have* the discipline that they are to give their pupils, by prompt and regular attendance at all the exercises of the institute. Each member should take notes, and at the proper time may be called upon for them.

ORGANIZATION.—Preliminary work in the organization of district schools, for the purpose of acquiring information, should include the visitation of board, of predecessor, and of parents, as well as the examination of records. All teachers, on leaving their schools, should deposit with the directors a statement of the members of each class, how far they have advanced in each study, etc.

In the construction of the permanent programme the necessary number and size of the classes should be considered, the alternation of study and recitation; the time required for study in different grades and in different branches; the length of recitations, both in the grades and branches; the hours when lessons should be studied as well as recited; and recesses and dismissions. From the number of minutes in the school day subtract the number devoted to opening exercises and recesses; the remainder will be the time that can be given to class exercises. Determine the necessary number of class exercises, divide the time at command by the number of class exercises, and the quotient will be the average number of minutes that may be given to each exercise; the time of the more important classes may be increased by shortening the time of the less important. The programme* should be constantly before the school, and strictly followed.

*SPECIMEN PROGRAMME FOR COUNTRY SCHOOL.

	P. M.	A. M.	MIN.	CLASS I.	CLASS II.	CLASS III.	CLASS IV.	CLASS V.
	1:00	9:00	5	OPENING.				
	1:05	9:05	10	*Reading.*	Reading.			
	1:20	9:15	13	Reading.	*Reading.*			
	1:40	9:30	20	Printing.	Slate Writing.			
	2:00	9:50	10	Reading.	Numbers.	Arithmetic.	Arithmetic.	Arithmetic.
	2:10	10:00	10	Printing.	*Numbers.*	*Arithmetic.*	*Arithmetic.*	*Arithmetic.*
	2:15	10:10	5	*Reading.*	Drawing.	Geography.	Geography.	Geography.
	2:30	10:15	15	Reading.	Reading.	Geography.	Geography.	Geography.
	2:45	10:30	15	*Writing.*	Drawing.	*Geography.*	*Geography.*	*Geography.*
	3:00	10:45	15	RECESS.	Reading.	Arithmetic.	Arithmetic.	Arithmetic.
	3:05	11:00	20	Spelling.				
	3:25	11:20	20	Spelling.				
	3:30	11:40	20	*Spelling.*	Spelling.	Spelling.	Spelling.	Spelling.
	3:40		10	Copying.	Spelling.	Spelling.	Spelling.	Spelling.
	3:50		10	*Spelling.*	*Spelling.*	*Spelling.*	*Spelling.*	*Spelling.*
				Oral Lessons.	*Oral Lessons.*	*Oral Lessons.*	*Oral Lessons.*	*Oral Lessons.*

The *italic* type indicates recitations, the common type the time when classes should study particular subjects. *The study programme is of as much importance as the recitation. Teach children to study.*

SCHOOL GOVERNMENT.—A theory of discipline takes account of the causes of disorder; of the ages and the conditions of children, and of the purposes of discipline.

The aim of discipline is to secure proper order, to form good habits, and to educate the will.

The motives for obedience are a natural love to be doing something; love for teacher and parent; love of praise, recognition, appreciation, and the force of authority.

The aids in disciplining a school are: 1. The character of the teacher, in personal excellence and self-control; his mastery of his business; his consistent and wise progressiveness, and his tact and love of the work. 2. The value of system used in carefully seating pupils; having a well-arranged programme faithfully executed; prompt and business-like movement; neatness, wise privileges, little friction, gymnastic exercises, [illegible]; and in keeping pupils busy.

Rules should be the fewest possible, necessary and just, and honestly enforced.

Punishment should include disapproval of teacher and parent, and temporary loss of privileges. Let corporal punishment be a last resort.

ARITHMETIC.—To present and develop any subject in arithmetic to a class of pupils, 1. Find out what they know of arithmetic in general; and 2. What is their stock of knowledge preparatory to a study of the subject in hand; have a clear idea of the subject to be taught; the natural divisions of the subject; their order and relation; and how much can be mastered by the class. Then, in each division of the subject, 1. *Teach* the process; 2. *Test* the pupils' ability to follow and understand the process; 3. *Train* the pupils to correctness and rapidity of work. Show the connections and dependencies of the several parts of the subject as to each other.

Develop and expand the idea of number in primary classes, by counting to one hundred with and without objects; and counting by 2's, 3's, etc. Write and read numbers to 10, 100, 1000. Develop the ground rules by simple additions, $2+2=4$, $2+3=5$, etc.; simple additions and multiplications, $2+2=4$, two 2's$=4$, $2\times2=4$, etc; simple additions and subtractions, $2+2=4$, $4-2=2$, etc.; simple subtractions and divisions, $4-2-2=0$, 4 contains 2 two times, $4\div2=2$, $\frac{1}{2}$ of $4=2$; simple multiplications and divisions, $3\times4=12$, $12\div3=4$, etc.; simple exercises combining the four rules. In accomplishing this, use objects when necessary or desirable.

Consider the denominator and numerator in common fractions; the office of each, their relations, and the effect of operations upon either or both; reductions, cases; addition and subtraction. Give model exercises, taking *reduction* as the topic unless otherwise requested by the institute. It is suggested that on the day previous the instructor ask the members to indicate through the question-box their choice of some topic in fractions.

Show the relations of decimal fractions to integers; their relation to common fractions, how derived from, and how changed to them; explain how their notation differs from integers; treat numeration, addition, and subtraction; multiplication, deducing rule for pointing; division, deducing rule for pointing.

In slate and board work for advanced primary pupils, insist on rapid reading of numbers carried to *nine places*; write numbers from dictation, beginning with the smaller ones and increasing gradually to those of *nine places*. Secure facility in the four ground rules, and in combinations of these rules.

Deduce the rule for the multiplication and division of common fractions, and give a model exercise upon the division of fractions, unless otherwise requested by the institute. Give a model exercise on percentage, the topic to be designated by the institute.

Suggestions.—As to the time to be given to the subject by primary classes; by advanced classes; for oral and mental exercises; and for written exercises. In slate and blackboard work require correctness, rapidity, and neatness. The rule should be elicited from the pupil as an expression of his understanding of the operation; and then revised by comparison with the rule in the text-book. The explanation should be a demonstration of the correctness of the rule, connecting the operation with the principles upon which it depends—not a mere description. The rate of advancement of pupils should be noted; constant attention given to rapid drill work; reviews should be frequent; and examinations honest and thorough.

GEOGRAPHY.—The unit to be studied and comprehended is the globe, considered with reference to its surface. As only the merest fraction of this unit can come under the observation of the pupil, his knowledge of it must be derived chiefly from books. The comprehensive study of geography involves a large and constant exercise of the imagination. Geographical knowledge consists of mere facts, and of facts that can be explained by known causes.

The ends of Geographical study comprise the acquisition of clearly defined notions, constituting what is known as useful knowledge; the development of the intelligence, though the acquisition of this knowledge. Nothing contributes so powerfully toward broadening man's sympathies and making him cosmopolitan and catholic, as geographical knowledge. In this day of universal reading, Geography should be one of the chief topics of instruction.

The formal study of Geography should be preceded by a short preparatory (oral) course of instruction, the purposes of which should be to teach the nomenclature of geography, and the art of reading maps. The formal study of Geography should consist of three stages, corresponding to the three successive stages of intellectual development; the *perceptive*, the *analytic*, and the *synthetic*. The point of departure, in the study of geographical science, is the globe. A subdivision of this unit should quickly bring the pupil to his own country, and when this has been thoroughly studied, other portions of the earth's surface should be regarded as representing detached portions of the surface of the globe. The following will thus be the pupil's order of progress: The obscure whole of perception; analysis; synthesis, and the clear whole of comprehension. It is suggested that instructors emphasize the study of local or home geography, of the spelling of geographical names, of the productions of the United States, the influence of climate and of surface on production, and the teaching of an intelligent use of maps and globes. Map-drawing should begin with platting the school-room, grounds and neighborhood. Uniform methods of representing land and water, coast lines, and mountains, should prevail in the same school.

PHYSIOLOGY AND HYGIENE.—Ignorance of hygienic law. Neglect to observe and to teach well-known laws of health. Effects of their observance upon the teacher, upon the pupil. Attention to school premises: Examine them before the opening of the term; insist upon cleansing, repairs, and supplies; inspect daily and arrange for the care of the outbuildings; disinfectants, copperas, chloride of lime, road-dust; light should enter upon the right and left; atmosphere supply, warmth, degree of moisture, purity; stove, jacket, cold-air box, ventilator, and board under lower sash. Attention to the physical condition of pupils; temperament, disabilities, degree of exhaustion, position, and exercise. Food and drinks—kinds, preparation. Contagious diseases, scarlet fever, diphtheria, mumps, measles, whooping-cough, and other diseases.

Text-book—oral teaching. Selection of topics for oral work. Digestive apparatus; teeth, number, time of appearance, structure, composition, use, preservation; salivary glands, use, position; saliva, use, when secreted; œsophagus, use, position, size; stomach, use, size, position, shape, orifices, need of rest; gastric juice, use, amount, where secreted, necessity for eating slowly; intestinal canal, absorbents. Circulation: Heart, arteries, veins, and capillaries. Respiration: Trachea, bronchi, lungs, air-cells, and breathing. Skin: Pores, perspiration, cleanliness, bathing, and clothing.

CIVIL GOVERNMENT.—Definition and object of government. Patriarchal, theoretical, monarchical, aristocratic, democratic, and republican forms.

Periods of the Government of the United States: Colonial, under Articles of Confederation, insufficiency of; under Constitution, origin and preamble. The branches of the United States government are the Legislative, Executive, and Judicial. Legislative—law-making. Congress: Senate, eligibility, number of members; and House of Representatives, eligibility, number of members. Executive—law enforcing: election of President and Vice President; powers and duties; and cabinet, how constituted. Judiciary—law interpreting: 1. Courts, supreme, circuit, district; and 2. Judges. Special constitutional provisions: Prohibitions on U. S. *habeas corpus*, *ex post facto*, etc.; personal rights.

Relation of the State governments, as represented by Michigan, to the general government: Rights of States, and State prohibitions. Branches of State government: Legislative—branches, power, number of members, eligibility, term; Executive—State officers, powers and duties, term, eligibility; Judiciary, 1. Justice courts, jurisdiction, functions; 2. Circuit courts, jurisdiction, officers; 3. Supreme court, how constituted, where held. County government. Township government. Municipal government.

Relation of the Territorial governments to the general government. How they differ from State governments.

PENMANSHIP.—Among materials and appliances are the best paper, fine and flexible steel pens, the common steel spring and wood pen-holder, ink not injured by freezing, blotting paper and pen-wiper, and slates and pencils for beginners, or lead pencils. Correct position at the desk—one of two positions; position of the arm and the hand, and position of the pencil or pen.

Send the entire class to the blackboard in sections of three or four pupils at a time. Begin with simple forms, parts before wholes, and secure prompt and uniform movement by counting. Attend to the whole arm and the fore-arm movements, *i. e.*, movements for making large and small forms or letters. Remind pupils of their errors by a system of critical marks for the margin of their work. Criticise frequently and kindly by showing errors and the ways to avoid them. Insist on the best work, done with neatness, with taste, and in order.

ELEMENTARY DRAWING. — Distinction between *vertical, horizontal,* and *oblique lines.* Drill in drawing vertical, horizontal, and oblique lines. Combinations of *two* straight lines: Dictate combinations; draw forms (flat) composed of; group combinations by twos, fours, sixes, etc., and draw preceding exercises from memory. Combinations of *three* straight lines: Dictate combinations; draw forms bounded by; group combinations by twos, fours, sixes, etc., and draw any previous work from memory. Distinction between *right, acute,* and *obtuse angles.* Drill in drawing angles. Combinations of *two* angles (*four* straight lines); or, combinations of *four* straight lines: Dictate combinations; draw forms bounded by, and name the lines and angles; group combinations, and draw any preceding exercise from memory. Distinction between *right-angled triangles, acute-angled triangles,* and *obtuse-angled triangles.* Drill in drawing triangles. Combinations of *two, four, six,* etc., triangles: Dictate combinations; draw forms involving, and name lines, angles, and triangles; group combinations, and draw preceding exercises from memory. Distinction between *square, oblong, rhomb, rhombus,* etc. Drill in drawing square, oblongs, etc. Combinations of *squares, oblongs,* etc.: Dictate combinations; draw forms involving; group combinations, and draw any preceding exercise from memory.

Teach what is meant by a *curved line.* Drill in drawing curved lines. Combinations of *two* curved lines: Dictate combinations; draw forms containing; group combinations by twos, fours, sixes, etc., and draw from memory. Combinations of *three, four,* etc., curved lines as above.

VOCAL MUSIC.—The influence which music has always exerted, and its consequent almost universal use, give it a prominence as a branch of education that demands more general attention. Its study should be commenced in childhood before the organs of hearing and vocalization become so fixed that musical sounds can neither be appreciated nor produced. In a sanitary view, singing is one of the best promoters of health. Its good influence upon the morals and deportment of the young is incalculable. The mental discipline acquired in learning the science gives it as high a position as any other study. Music, as a means of vocal culture is unequaled, and greatly aids in making good readers and speakers. In the light of economy, the cost for tuition to the parent, in the way of private instruction, would be greatly lessened by having music taught in the public schools; while those who, from poverty, would otherwise never receive any musical training, would be greatly benefited.

It should be taught by the regular teachers, *all of whom,* regardless of previous special preparation or natural talent, if so disposed, may obtain good results, by devoting as a change, and thus as a relief from other studies, a few minutes at various intervals, to the amount of fifteen or twenty minutes in each day, and by having exercises and songs placed upon the blackboard, to be copied by the pupils as desired, and not requiring the use of text-books except in higher grades.

Among general points to be observed by teachers are the following: Position of the body, which should be erect, not leaning in any direction, with the feet placed squarely upon the floor. Exercises and songs within the compass of pupils' voices. Singing at and in correct pitch, using a tuning-fork, pitch-pipe, organ, piano, or other instrument, to obtain the same. Proper use of the voice, which includes breathing, so as to produce lung-power; position of the throat, tongue, and mouth; and singing softly and smoothly to secure good quality of utterance. Intelligent expression, comprising distinct articulation, correct sounds of vowels and consonants, breathing at proper places, and proper movement and accentuation.

General arrangements: School organized into classes according to ability of pupils; each class to have special work suitable for it; school to have exercises and songs within the ability of all; and entire school to be interested. Younger classes: Rote exercises and songs; easy lessons in reading signs: establish the relation between signs and tones; exercises in keeping time; exercises in notes in different keys, without theory; together with such other simple features as occasion may require. Older classes: Excises in songs in one, two, or more parts, to be learned by note; writing music on slates and blackboards; and a practical knowledge of the different kinds of measures, usual kinds of notes and rests, ordinary intervals in the scale, easier accidentals, and the different keys, giving attention to other features as needed.

SPELLING.—Begin spelling with the first words the child learns to read. Orally, and by copying on the slate; first in printing, but as soon as possible in script. Do this regularly from the first.

Continue systematic instruction throughout the whole school course, using for material, the child's vocabulary; words in the reading book, words in the spelling book, words in the text books, misspelled words from composition and other written exercises, and dictation exercises. Sentence spelling with special reference to capitals and marks of punctuation. Spelling by sound; orally, and by use of written characters and diacritical marks.

Use the dictionary to learn correct spelling, to secure correct punctuation, to learn the powers of the letters, and the use of diacritical marks. Teach few rules. Teach these inductively. Teach them thoroughly.

The instructor should give a *model exercise in spelling,* taking his class from the members of the Institute, and following any approved method which he may choose.

LANGUAGE LESSONS.—The objects of language lessons are, the acquisition of words—vocabulary; the use of words to express ideas—the sentence; pronunciation; and punctuation and capitals. The material for these lessons are good pictures and objects, with talks by teachers, then questions; the answers by pupils being in sentences.

Copying words, sentences, and paragraphs, and writing from dictation. Making sentences with given words, or upon specified objects or topics of the reading lessons. How to begin and end a sentence.

Word studies as to form: *a.* Diacritical marks, and *b.* Abbreviations and contractions. As to meaning—especially in reading lessons: Prefix and suffix, compound words, and defining—chiefly by synonyms and equivalent expressions.

The sentence, introductory to oral grammar: Formal development and defining; and parts, forms and requirements. Nouns and verbs: Descriptive words and phrases of each; and practice in selecting them from the reading lesson. Word studies extended: Derivation, formation; proper use of dictionary; defining extended to phrases and groups of words. Some attention to figures of speech.

Abstracts of reading lessons for formal writing. Paragraphing. Reproducing the substance of reading

lesson or story from memory. Formal compositions —subject selected beforehand and worked up at several sessions of the class preparatory to writing. Letter-writing: Parts,—folding, addressing envelope. Written work in all studies where practicable. Every exercise to be critical, not only in respect to accuracy in punctuation, spelling, capitals, and paragraphing, but also in choice of words and facility and beauty of expression.

Language lessons for higher grades contemplates the development and manipulation of the sentence; a system of word studies; punctuation; grammatical elements defined and illustrated as taken up; converted into equivalents, as compound sentences into complex, participial phrases into relative clauses, etc. A good plan is about as follows: A subject, usually descriptive, is proposed and directions given to write *ten* sentences, each descriptive of the subject, and each to contain some given grammatical element; also, a few words are named to be wrought into the required sentences—words that are likely to need a resort to the dictionary to be fully comprehended; the class should be asked to define these words in their own language, to find their derivation, derivatives, and nearest synonyms, with exact difference of meaning.

MORALS AND MANNERS.—Our actions affect others. Moral relates to what ought or ought not to be done. Correct morals and good manners necessary to the interests of society. The good of the state demands *moral* as well as intellectual education.

The character of the teacher is fundamental. He should be prudent, polite, earnest, inspiring, and worthy of imitation. Teachers must love pupils to influence them rightly. Draw lessons from common life, the school-room, play-ground, and school discipline, consider the relation of pupils to one another, to their teachers and parents. Special topics: Truthfulness, honesty, chastity, in thought, word, action, obedience to parents, teachers, and civil authorities, respect for superiors, kindness, generosity. Correction of bad habits, idleness, profanity, lying, stealing, obscenity, tobacco, intemperance, etc. Formation of good habits—industry, cleanliness, self-reliance, cheerfulness, promptness, etc. Attack prevailing evils by a kind and thorough general talk; special ones singly, in private. Vocal music. Moral culture depends on the cultivation of the will. Illustrate the method of treating one of the evils named above, as idleness, profanity, lying, etc.

ART OF QUESTIONING.—The purposes of questioning are teaching and testing, the former to aid and guide the learner in acquiring knowledge, and the latter to test and examine the learner as to knowledge acquired.

The matter, manner, and form of questioning should be adapted to the age and development of the learner, and to the nature of the subject. Three stages of development should be recognized; early childhood, youth, and beginning maturity. Teaching questions, especially, should conform to the obvious laws of mental suggestion and association.

The pre-requisites on the part of the teacher for profitable questioning, are a thorough knowledge of a subject and its relations; a clear conception of the important points of a subject, and of its difficulties; some knowledge of the general laws of mental action, and of the special laws of suggestion and association; and a knowledge of the condition and peculiarities of the learners.

All questions should be clear and definite, both in thought and language. Teaching questions may be suggestive. Testing questions should neither involve nor suggest the answer. Teaching questions should be put slowly; examination questions may, on many subjects, be put rapidly. Teaching questions may be answered by a class collectively. Testing questions should usually be answered by individuals. Definite and complete answers should be required. The answer naturally and logically forms the first part of the reply. The personal manner of the questioner is worthy of the teacher's attention.

Command the attention of *young pupils* by an animated manner, and by addressing curiosity and expectation; of older pupils by brevity and clearness of language, and by logical connection of matter.

ERRORS IN THEORY.—These lead to errors in practice and arise from ignorance through lack of early education, through errors in early education, and through failure to keep abreast the best thought of the day.

Among these errors the following may be enumerated: Logical reasoning is expected of young pupils, concerning subjects of study, and concerning matters pertaining to school government. It does not pay to attend educational gatherings, and read educational works. A teacher must think and talk of nothing else than school. The sole object of studying is the acquisition of knowledge, the work of the teacher being principally to *instruct*, and the object of recitation merely to determine the daily progress of the pupils. The word method *solely* is the correct plan of teaching reading. Children are taught to read merely that they may entertain others. Like offenses should receive like punishment. Stupidity in a pupil is a crime. Parents have no rights except to pay taxes, and fault-finding by parents is a sure indication that they are unreasonable. No preparation is necessary for work of lower grade. Self-government is not necessary to the government of others. Self-control is not essential to the best disciplinary and teaching work. Quantity rather than quality is the measure of progress.

ERRORS IN PRACTICE.—These arise from errors in theory; lack of natural adaptation, and lack of devotion to the work. Among these may be enumerated:

Too much prominence given to solving problems in arithmetic to detriment of drill upon combinations. Rules and their application in grammar rather than drill in correct use of language. Unreasonable demands upon pupils. Extreme conservatism, little growth, rare promotion, and jealousy toward teachers that do grow. Narrow-mindedness, and magnifying unduly the office of teacher. Pupils *learn* much; can *do* nothing; are filled, not strengthened; continual pouring in, no training to use; continual driving of nails, no clinching; proper attention not given to making pupils self-confident; teacher does not illustrate and explain properly. Pupils not prepared for subsequent work; do not have vocal organs cultivated to distinct articulation. Pupils taught to read fluently rather than intelligently; good reading in school, poor reading elsewhere; taste for reading not cultivated. Some punishments too severe, others too light; pupils unjustly blamed, unnecessarily discouraged. Patrons ignored; teacher lacks support; failure to study one's own faults. No illustrations, or poor ones, waste of time, unsystematic work, failure to make most possible out of lesson. Getting angry with pupils; with parents. Talking too much in assertion of authority, reprimanding offenses, telling pupils what they can find out themselves, telling pupils what they cannot understand. Talking too loud, which wearies teacher unnecessarily and disturbs school. Advancing pupils too rapidly, by which real progress is retarded, pupils

are discouraged, and injustice is done to subsequent teacher.

TEACHER AND PARENT.—It is the teacher's duty to interest parents in school work, indirectly through his pupils, through the press, and by making his own abilities known; and directly, by conversation and social intercourse, by exciting an interest in practical science and scientific reading, and by public talks or lectures.

It is the teacher's duty to set an example of true dignity, and of reverence for parental and civil authority, by avoiding all gossip, especially in local matters; by courtesy in dealing with parents, and by freedom from a dictatorial spirit; by readiness to explain plans, and to adopt sensible hints and advice; by faithfully conforming to the laws of the school board; by consulting parents as to the studies of their children, or as to any serious correction or punishment to be administered; and by truthfully reporting, when necessary, the standing of children to their parents.

INTELLECTUAL UNFORTUNATES.

MEDICAL INSPECTION OF SCHOOLS.

THE following article recently appeared as an editorial in the *Hospital Gazette*, high medical authority. It recognizes the great fact that defective mental and physical organization is the cause of a large portion of the crime that afflicts society and peoples our prisons, and suggests, as a remedy, the appointment of paid medical inspectors of schools, with the duty of pointing out, among the young, those likely to become members of the dangerous class, and providing them with such training as may correct their wicked tendencies. The suggestion is worthy of consideration, but we more than suspect that in all such cases a *moral* doctor is more needed than a *medical* doctor:

Upon a former occasion we urged the importance of medical inspection of schools as a means of securing promptness and regularity of attendance. The arguments then used had a pecuniary weight, and were selected for that reason, since they would address themselves more forcibly to the cost-calculating mind, and make an impression favorable to the cause with a desirable class of people. This impression would serve as a foundation, other reasonable approaches could then be made, and a solid opinion finally evolved, which would produce good work, tangible results. These calculators, the dollar and cent men, are sure in their work, although they are slow; they need to be convinced first, then they labor with a purpose and to a fixed point. They can be convinced, for they are the single exception to the truism "convince a man against his will, he's of the same opinion still."

We press the subject again; this time from considerations of the necessity of aiding, developing and perfecting, if possible, the intellectual and moral attributes of children naturally deficient mentally, therefore morally weak.

The commonest observation reveals variety in intellect as extensive and evident as variety in faces. No two faces are alike, no two minds approximate each other; humanity demands a special mould for each cast. Intellects differ in power, quality, and material, as much as faces and forms in beauty and shape, ranging from glimmers of the consciousness to almost divine perfection. Instructors recognize these degrees of mentality, and press a word to serve their notion as to them; each pupil is credited with a "capacity," suggestive of prevailing cramming and stuffing processes, even if called methods of instruction. "Capacity" is so inappropriately employed, that it is not in our hearts to condemn the wealthy parent who endeavored to silence the professor's complaint about his son's want of a "capacity," by telling the professor to buy for the son "one of the best capacities in the stores; send me the bill, the price makes no difference."

Defects of the mental nature at birth are as common as physical imperfections, though not so immediately apparent to the sight. The latter manifesting themselves at once, are examined, considered, and removed or reduced by surgical art, if possible, and the life that deformity threatened to shadow, is made pleasant by timely care and scientific skill. Parental love prompts such a course, and the measure of their goods alone limits the height of the skill and care which the parents employ for the task. Public interests require that if those means are not sufficient, public funds should furnish the deficiency, since the little treasure applied at the right moment will ensure a happy, able-bodied citizen, while its being withheld most probably swells the pauper list and the poor tax.

What duty suggests as to the care of the physically unfortunate, is greatly multiplied for children whose mental and moral constitutions are defective. The institution of the public school system, with its compulsory attachments, demonstrates the universal concession of the right of the public to demand mental training for the young, as a safeguard for posterity. The great mass of children are educated, willing or unwilling, that they may be fitted for the duties of manhood, that they may be good citizens, contributing to the country's wealth rather than being a burden upon it. Excellent provision, not perfect as yet, has been made by the government to give the benefits of education to all. The later years have been prolific of improvements in sanitary, architectural, and professional aspects of the schools, and the public are earnestly demanding continued improvement, regardless of expense.

With such educational accommodations freely extended to the youth, their education, if possible, must be secured, and those having control of the schools must be alive to their duty of including every child as among those to be benefited. In the neglect of this, is the notable failure of our school system, and the chief cause of our growing prison arrangements. The public school system should reach every child with its blessings, that its glory should be greatest; especially should it reach such as, being deprived of public assistance, would have no other path to education open to them. The system is not designed merely for the children of strong and perfect mental powers; but it seems to us that the intellectual unfortunates, who will, if uncared for, become public burdens, should have especial attention accorded to them by the public school authorities. Our common schools ought to be so conducted that they would redeem and remedy as many crime-promising buds as possible, even if special effort is needed, remembering the

value of opportune effort, and the certainty of a blasted life coming from an imperfect mind. Some mentally diseased, like some physically faulty, are hopeless, but these exceptions must not work to the condemnation of the curable. Their certain sad fate ought rather to be incentive of effort for all, until hope is forever gone for each.

We cannot expect that teachers will be able to accomplish the work required in this specially important department without assistance and guidance, for we know that their labor in developing to the examination standard the bright and the better pupils will fully occupy their time. This task is positively exhausting to the teacher, as demanded by the present regime, without his undertaking the special labors of furnishing capacities and reducing mental dislocations, or uniting intellectual fractures; mediocrity in which has been attained by few in the profession of medicine, and excellence in which has come to a bare handful in a century. The young intellectual unfortunates are and must be neglected in the great Public School System at present, as the teachers have neither the time nor special ability to build for them the lacking parts; the neglect is discontinued in every other place, and the unbalanced intellect develops itself as it pleases. The imagination and fancy lead out the strong passions, and life is shadowed with crime and its penalties; or if consciousness be present, a living death, out of human sight and touch, is the goal sought. The less afflicted furnish the prison population—for, if with the greatest advantages of education and perfect mental powers, some fall, what can be expected of mentally and morally defective creatures, untutored and uncared for. The private loss sustained by crime, and the public tax for courts and prisons, is the demand that these creatures in their days of strength make, and obtain from society. Society reaps a fitting reward for her neglect of them in their plastic days.

The question comes squarely before us as civilized beings, What must be done for these unfortunate children? The state has provided by her system of schools, a means of gathering them together, and upon that foundation all effort must build. The question has a medical significance, and the physician must be represented in the council that suggests remedies. Medical inspection, responsible and remunerated, must be provided. The conditions and manifestations of weakness in the mental and moral natures of the pupils must be hunted out by an experienced eye, and the remedy applied and advised in the formative seasons.

The influences brought to bear upon a weak or wavering mind, in its early days, determine that life. Skill and care develop a self reliant human being; neglect opens the prison doors for the unfortunate.

EDITORIAL DEPARTMENT.

THE SCHOOL JOURNAL.

LANCASTER, NOVEMBER, 1879.

J. P. WICKERSHAM. . . . . J. P. M'CASKEY.

BOTH teachers and farmers will be interested in the first article in this number, "Education in Europe as it affects Agriculture." It not only contains valuable information, but its practical suggestions are well worthy their careful consideration.

THE Secretary of the National Educational, Association, Mr. William D. Henkle, Salem, Ohio, announces that he expects to have the volume containing the proceedings of the meeting at Philadelphia, ready for delivery to members, January 1, 1880. He further says:

The volume will be a valuable one. Many teachers failed to get to Philadelphia. If they will send us by mail two dollars, we agree to publish in the volume their names in the list of members and to send them the bound volume. Send on your names. Life-memberships, $20, will also be gladly received. The Association is badly in need of money to pay the expenses of printing and binding the proceedings. Every Superintendent in the country ought to enroll himself as a member of the National Educational Association, and become a reader of its valuable annual volumes.

WE are in regular receipt of the official bulletin of the Minister of Public Instruction in Italy. The last number contains over one hundred pages of matter, mainly consisting of statistics relating to schools, and appointments to positions in the corps of instructors of the higher educational institutions of the country. In Italy, as in France, the central authorities name the Presidents, Directors, Professors, etc., in the Universities, Colleges, Polytechnic and Professional Schools, Academies of Art, etc., etc. It seems strange to an American to see the whole educational force of a country moved about like an army, Presidents and Professors being as much subject to the control of the central power as are our officers and soldiers.

MR. SCOTT RUSSELL, an eminent English iron ship builder, in lamenting the decay of British manufactures, states a fact of great significance:

We have not failed to notice that it is precisely those nations which have been systematically giving a course of preparatory training and education to their population in their skilled trades, that have shown the most marked progress in national industry in these successive exhibitions. Prussia, Switzerland, Belgium, France, and America, seem to make progress *in proportion to their excellence of educational training.*

MICHIGAN a few years ago abolished the county superintendency, and established a system of township superintendency in its place. Those acquainted with the subject predicted a failure at the time, but they were outnumbered by the class with whom ignorance and conceit supply the place of knowledge. The experiment was tried, and now everybody is dissatisfied with it. The township superintendents receive little compensation, and, of course, are generally incompetent. The schools are visited without profit, and the examination of teachers has become a farce. The old county teachers' institute, that did so much to improve teachers and to mold public opinion, is a thing of the past. The friends of the public schools say: "Our system is completely demoralized. There must be reform, or it will die."

THE following is a translation of the new law of Belgium in reference to religious instruction in the public schools:

ART. 4. Religious instruction is left to the care of families and ministers of the different denominations.

A place in each school is put at the disposition of ministers of religion, that they may impart therein, before or after the regular school exercises, religious instruction to the children of the respective communions or congregations frequenting the school.

The authorities of the Catholic Church in Belgium have taken issue with the government respecting the enforcement of this, and have threatened excommunication to all teachers occupying positions in schools under it, and to children over a certain age attending these schools.

THE section of the Jules Ferry bill, which has met with so much opposition in the French Assembly, reads as follows: "No person belonging to an unauthorized religious community is allowed to govern a public or private educational establishment, of whatever order, or to give instruction therein." This, of course, is aimed at the Jesuits, who, under existing laws in France, belong to an "unauthorized religious community," and who have under their control at the present time a large number of schools, and are accused of implanting in the young minds of their scholars ideas of disloyalty to the State. The members of other religious communities, many of them Catholics, take the oath required by the government, and teach without objection; but the Jesuits will not do this, and the government is determined that they shall either conform to the law, as others do, or shut up their establishments.

WITH the October number the *Educational Voice*, Pittsburgh, assumes a new form and puts on a neat cover. The *Voice* is owned by the Teachers' Institute of the city, and is edited and published by a committee under its direction. At the head of the present committee is the veteran teacher, A. Burtt. In his hands one can well believe what is claimed, that "the *Voice* will not be the organ of any sect or sex, party or clique, but of the teachers, and it will do battle manfully for their true interests." All who would like to see what a live body of teachers can do should subscribe for the *Voice*.

Nor is the Allegheny City Teachers' Institute to be outdone by the Institute of Pittsburgh. A committee under its direction has commenced the publication of a monthly magazine called the *School and Home*. It makes a good appearance, is filled with good matter, and will no doubt be well sustained.

THE question of having some of our many excellent ladies on the Board of School Trustees, says the New York *School Journal*, merits serious attention. There is apparent abstract justice in having the mothers of children and our women tax-payers represented, to make it at least interesting to find out how the plan has worked in the various places where it has been tried. Twenty years hence the presence of women on school boards will be an old story, and that they could ever have been excluded will seem an absurdity.

BY her new law Belgium has followed the example of Holland and Switzerland, and has secularized her public schools; that is, she no longer includes formal religious instruction as a part of the regular course. The teachers are still required to impart moral and unsectarian religious instruction, and a time and place are provided in all the schools where ministers of different denominations may give instruction, according to their own liking, in religious matters, to such children as desire to to receive it. But this liberal provision is unsatisfactory to the authorities of the Catholic Church, and a bitter contest is the consequence. The following is an example of what is taking place all over Belgium:

The Cardinal Archbishop of Malines has instructed the Belgian parish priests that they are to inform the burgomasters that they cannot give religious instruction in the public schools. They are to prevent the public from frequenting them, and the teachers from continuing to teach in them, and to forbid the people of their parishes, wishing

to become teachers, the entry into the public normal schools, inviting them to frequent the Catholic Normal Schools. The clergy have also been instructed by the bishops to refuse absolution to the parents of all children frequenting the public schools, to the teachers in them, and to the pupils of the normal schools. In every parish at least one Catholic primary school is to be established. Catholic religious instruction by the priests being now prohibited, the Government will make use of the means mentioned in the new school laws for securing it for the pupils for whom it is desired.

THE *American Journal of Education* says: "At the Iowa Agricultural College every girl in the junior class has learned how to make good bread, weighing and measuring her ingredients; mixing, kneading, and baking, and regulating her fire. Each has also been taught to make yeast, and bake biscuit, puddings, pies, and cakes of various kinds; how to cook a roast, broil a steak, and make a fragrant cup of coffee; and in short, to get up a first-class meal, combining both substantial and fancy dishes, in good style. They have taken practical lessons in all the details of household management, such as house-furnishing, care of beds and bedding, washing and ironing, care of the sick, care of children, etc. The girls, we are informed, are also thoroughly grounded in science, mathematics, and English literature; but this is of no small moment compared with the former catalogue of virtues."

THE second session since the admission of women to full rights of students in the classes of arts and science at University College, London, has just begun. The experience of the first session completely justified that admission. Except that the women students have a separate common room with female attendants, and that there are, for different reasons, a few classes open only to women, and a few open only to men, the departments of arts, laws and science, admit women and men as fellow-students upon terms in every respect equal. During the last session there were 211 female students; while instead of the decrease in the number of male students, which some wiseacres feared, there was an increase of fifty. The whole number of students now in the college is 2,000. It is very seriously worth while to note the social result of co-education in this prosperous and dignified college, as published in *The London Times*: "There was no difficulty whatever," it says, "in the working of the system; the sense and courtesy that regulate society in the outside world, where men and women are accustomed to meet daily, are not wanting in the minds of students; there was no breach of college discipline, nor was there even a breach of courtesy within the knowledge of the deans."

WHILE in San Francisco, General Grant was received at the Woodward Gardens by some 30,000 school children of the city. In response to an address of welcome, in behalf of the children, by Mr. Heister, President of the Board of Education, General Grant said:

> It is a gratifying sight to witness this evidence of the educational privileges afforded by this young city. The crowds gathered inside and outside of this building prove that every child of an age for school is provided for. When education is so generally diffused, we may feel assured of the permanency and perpetuity of our institutions. The greatest danger to our people grows out of ignorance, and this evidence of the universality of education is the best guarantee of your loyalty to American principles.

The long line of children marched past the General and almost smothered him with bouquets. He remarked that it was the most pleasing reception he had ever enjoyed.

THE cost of the English elementary schools last year was $19,577,250. They instructed 3,154,973 children. The French elementary schools, during the same time, instructed 3,823,000, and cost $13,630,000. This is almost six and a half dollars for each pupil in England, and less than four dollars in France. In Pennsylvania we pay about *nine dollars* for each pupil. The salaries of teachers are, in a general way, much lower in Europe than in America.

THE conductors of teachers' institutes in the State of Wisconsin recently held a meeting at La Crosse, for the purpose of considering the best plans of preparing themselves for their work. This is a praiseworthy movement. There is a large number of persons who manage to have themselves employed as instructors at teachers' institutes, who have never been themselves instructed, and who have no qualifications for the work that they so rashly undertake to do. Among them are book-agents in disguise, parties who have an axe of some kind to grind, effete professors, adventurers, dreamers, queer and crochety people, who have never looked but on one side of some one thing. It is difficult for a teachers' institute to escape the infliction of some stuff emanating from such sources,

but the quantity should be reduced as much as possible. This Wisconsin plan is a good one if it enables those in authority to select competent men to conduct institutes—to separate the thin wheat from the abundant chaff.

THE State Normal School of Michigan has adopted the policy of receiving no students but those who desire to prepare themselves for teaching. All academical students are placed in what is called the School of Observation and Practice. This school is under the control of a principal and two assistants, but the teaching is all done by the student-teachers. The policy of limiting the Normal Schools to strictly professional work is without doubt theoretically right. Circumstances have hitherto compelled these schools to open their doors to academical students; but the pressure of these circumstances is gradually being removed, and unless we mistake the demands of public sentiment, they must all sooner or later come to stand upon a strictly professional basis. In Pennsylvania, it looks to us likely that the Legislature will attach a condition of this kind to future appropriations to our Normal Schools. The State never intended that these schools should be in whole or in part academies. Academical students were allowed to be admitted after all the professional students making application had been accommodated; but the purpose of this provision was merely to strengthen the schools in their infancy, not when they had grown to manhood, to enable them to become high schools and colleges for general education. Forewarned is to be forearmed.

BRADFORD COUNTY seems to have had a special building at the late fair for the school exhibit. The *Reporter* says of it:

This building was one of the most attractive on the grounds, and was constantly filled by visitors. The exhibit showed the progress made in the public schools of the county, and was of interest and value to every friend of common schools. The Susquehanna Collegiate Institute, the graded schools of Towanda borough, Troy borough, Athens borough, and the common schools of various districts, sent their philosophical and chemical apparatus, specimens of drawing and maps and penmanship, by scholars, charts in physiology and geography, and other evidences of good teaching and apt scholarship, making an attractive and valuable collection. Professor Ryan, County Superintendent, superintended the arrangement, and the exhibit was the proudest evidence he could offer as to his efficiency and value as the superintendent of the schools of the county. His assistants were Mr. A. T. Lilley, who contributed a large collection of minerals and fossils, William J. Horton, an enthusiastic friend of educational interests, Charles Felton, a graduate of the Towanda graded school, Mart Bowman and Frank Coverdale.

WE have received the ninth annual report of the Trustees of the Metropolitan Museum of Art, New York. Its purpose is the same as that of the Museum and School of Industrial Art, Philadelphia. Both are modeled after the great South Kensington Museum and School, London. The building in which the Museum is located is in the Park, and cost about $500,000. The collections, including the celebrated Cesnola collection, are already quite large and valuable, and provision is made to increase them. The object is in the near future to establish a museum containing collections illustrating every department of art and industry. The report says:

As an educational institution, its value is great. The attention of scholars has been largely directed to our collections. They have been discussed in the periodicals of every nation in Europe. Students in all departments of art, history, and the history of man, find in them new funds of illustration and information. The Cesnola collection is of necessity the place of pilgrimage of all who are interested in early Greek and Phœnician history, literature and art. To this should be added, for American students, collections of art of all nations, ancient and modern. Industrial arts should be here shown in the most plain and accessible manner, so that a girl, man or woman, may see the whole process of manufacturing metals from the ore, to the most beautiful products of art in metal, from the rough wood to the beautiful fabrics of household ornament and use, from the raw hide to the exquisitely tooled book-binding, or the beautiful harness. Every apprentice should find here the teaching his eye needs, whatever his department of labor. Every skilled mechanic should find here the beautiful object which it must be his ambition to equal. Every workman who handles a prepared material, should be able to come here and see what the material is originally, and by what processes it has reached the useful condition in which he handles it.

TEACHING READING.

THE new method introduced this year into the primary schools of Boston is an advance in the art of teaching children to read, which would seem to be a very natural one after the triumph of the word method, and, like it, encounters great opposition. While it is the development of the word method, it is much more. It is an application of the principles of object teaching, and it reverses the traditional order by teaching the child to read written words and to write them before he reads printed words, or even knows the alphabet.

Without undertaking an elaborate exposition of this methed, we will give a brief sketch of it. The teacher, perhaps, draws on the blackboard a picture of a cat, and by conversation gets the attention of the children

to the subject. Then she writes the word "cat," and tells them what it is, talks about the word, erases it and writes it again, makes a column of repetitions of the word, constantly calling upon them to recognize and pronounce it, requires them to watch her as she writes it slowly, to see where she begins and how she proceeds.

When she has dwelt on the word sufficiently it is left on the board, and the children take their slates and pencils to make the word for themselves. Their work is examined individually, corrections made and hints given. They write it over and over again. By such a system, the pupils acquire in a few days a knowledge of several simple words, including, perhaps, two or three verbs and adjectives, and read short written sentences, and can write the sentences themselves with surprising faithfulness to the teacher's copy, or even from dictation.

In a few weeks, the pupil has acquired a considerable written vocabulary, and has an acquaintance by eye and the power to make with pencil all the more common combinations of script letters. Then the teacher may begin to teach the printed words, either from the blackboard or with charts; but not neglecting the writing, which is continued constantly, so that the pupil habitually uses the pencil and practices writing, not as penmanship with careful teaching of up stroke and down stroke, and ovals and loops, but imitatively. In time the letters composing words are the taught, and then the pupils are exercised in spelling the words they write.

The editor of the *Advertiser*, who has witnessed this method of teaching, now pursued in the primary schools of Boston, says of it:

Of course it has not been long enough in operation here to enable any conclusions to be drawn as to the ultimate success of the method. It is as new to the teachers as to the children; but several with whom we have conversed appeared to have no doubt that the children would advance faster than under the old system, and that at the end of three years from entrance to the schools the class trained in this way would be better readers, better spellers, and better writers, than the primary schools have heretofore sent to the grammar schools. However, this is not merely a matter of conjecture. For several years the system has been pursued in the schools of Quincy, and we believe there is no longer there any question of its superior advantages. If this reference to the matter should lead any one to desire to know more about the system as a system, and the results achieved where it has been tried several years under favorable conditions, he may find them very fully and interestingly described in a paper prepared last spring for the association of school committees and superintendents of Norfolk county, by Charles Francis Adams, Jr. The paper is entitled "The New Departure in the Common Schools of Quincy."

Elsewhere, in this number of *The Journal*, the reader will find a very interesting sketch of a visit to the schools of Quincy, Massachusetts, to which reference is here made. The success of the experiment now under trial here, in all the elementary work of the school-room, is attracting much attention, and the Quincy leaven is working far and wide.

SHENANDOAH SCHOOLS.

WE have received, in pamphlet form, a copy of the "Annual Report of the Board of Directors and Superintendent of Public Schools," of Shenandoah, Pa. Shenandoah is a thrifty town of some eight or ten thousand inhabitants, in the Schuylkill coal region. Up to 1874 its schools were without effective organization, but about that time some public-spirited citizens took the matter in hand, elected a superintendent, and after a long struggle, and a somewhat bitter fight, succeeded in establishing a system of schools that would be a credit to any city or borough in the State. During the past year a new High School building was erected, and the future looks bright. Already students have been prepared for college and for the Senior class of the State Normal schools.

From the report of the energetic Superintendent, G. W. Bartch, we take the following on

LANGUAGE LESSONS.

Since the intellectual advancement of pupils depends largely upon their command, use, and understanding of language, this study cannot be introduced too early into the schools; but, as young pupils are not capable of comprehending the technicalities of grammar, nor the language of logically compiled textbooks, a system of language lessons, well graded, seems to be absolutely necessary to facilitate progress in other branches of knowledge. As applied in our system of instruction, these lessons constitute an oral training in language, adapted to the different grades, throughout the primary, and a part of the grammar school departments. In the first and second grades of the primary department, they are presented in the form of conversational exercises, with the use of objects. In this way the little children are taught to observe and to think quickly, as well as to express their thoughts in their own language, giving their teacher the opportunity of correcting, in a proper way, all incorrect expressions which the pupils may have been in the habit of using. Thus, the teacher, entering into a conversation about some familiar object with his pupils, by a process of questioning and suggesting, is enabled not only to develop the correct use of language unconsciously on the part of his pupils, but also to increase their command and comprehension of words (careful attention being given to their pronunciation and meaning), their knowledge of the object, the names of its parts, and awaken an earnest desire to see, to know, to understand.

In the succeeding steps of the primary department instruction in pronunciation, expression, and the proper use of words is continued; and the construction of different kinds of sentences, as well as the parts of speech with reference to their use in the sentence, receive special attention; while, in their composition, pupils are taught to correct, as far as possible, their own errors. In the first grade of the grammar department, lessons in language are continued with oral instruction in grammar. The pupils are made acquainted with the parts of speech with reference to their grammatical relations; and, in their composition, they are required to give the reasons for the arrangement of the words, in the construction of the different kinds of sentences. At the beginning of the second year in this department, the text-book on grammar is introduced in connection with oral instruction. The teacher should require each lesson to be reproduced by the pupils on the slate or paper, and in conducting a recitation, he should have in view the accomplishment of some particular object, otherwise, his labor will be in vain. He who teaches at random, without some ideal, some end he determines to reach, proves but a stumbling-block to his class. No text-books have yet been introduced on this subject. The objection to their introduction is based upon the fact, that, when pupils are supplied with them, teachers are too apt to resort to the memorizing process, and the pupils, not being able to comprehend the language, losing their interest, if any has been awakened, become discouraged with the subject. The living ones of a live teacher of language have much more effect upon the young than printed matter. They can not become interested in what they do not understand. After pupils have been properly taught the use of language, they experience but little trouble in the more technical study of grammar. It is, however, a lamentable fact that many teachers are almost total failures in their attempts to impart a knowledge of this subject. Among all the branches of our common school curriculum, there is, perhaps, not one which is more poorly taught by the average teacher, than language, and yet, every one highly appreciates the value of its correct use.

DIGNITY OF SKILLED LABOR.

THE great commoner of England, Mr. Gladstone, has made many sensible speeches to his countrymen of the working class, but he never made a more common sense speech than when he uttered the following remarks:

I would advise that the people of this country should give more attention than they do to raising hand labor of all kinds to the excellence of which it is susceptible. They are too fond of getting out of hand labor and getting into what they call head labor—that is to say, getting sufficiently acquainted with reading and writing and casting up accounts, perhaps, to get into the lower class of clerks. I do not believe that there is a more distressed class in the country than that class, and I believe that a great number of young people would do infinitely better for themselves and for society if they were content to keep much more than they do to the use of their hands, and would try to raise the character of the labor which they perform with their hands, because, pray remember this, that great deal of the very highest labor is labor performed with the hands.

Look at the labor of the painter, of the sculptor, and not only so, but look at a great many intermediate kinds of labor—hand labor which is strictly all dependent on an excellent hand. Now, there is a great deficiency of that kind of labor in this country. Go into the study of a sculptor in London, and you will find that the sculptor, probably an Englishman, is obliged to have a great many assistants, because working at the marble requires very much to be done before the stage of finishing comes, and these assistants are well paid; but if you come to talk to them you will find that in the large majority of cases they are not Englishmen at all, but Italians and Frenchmen—very commonly Italians. What I want you to do is this—not to be in such a hurry to get into so low a class of head labor as copying clerks or something of that kind.

People should recollect that handicraft itself is capable of being raised to a very high description of art and of yielding a very high standard of remuneration. I cannot tell you how anxious I am to impress that upon the mind of young people, and how certain I feel that the lesson is one of great importance to the people of this country. Let them perform their work in the spirit of an artist, let them try to give it excellence and make it a thing that not only will sell, but as good as they can make it; and the more they try to do it the better they will be able to do it.

FARMERS' WIVES IN IOWA.

THE following is an extract from an Iowa letter to the *Woman's Kingdom*. It has an educationl significance:

Stopping at Low Moor, I visited friends four miles from the station. I found the farmers' wives and daughters of Iowa as eager for knowledge as the women of Illinois, and as earnest in their endeavor to obtain it.

After the hurry of summer's work is over (and none of these women keep hired help unless on extra occasions) they meet at each other's houses, each lady having taken up a special study or studies, and recite to one another, varying the exercises with recitations, selected or original, and music, both vocal and instrumental, and conversation (not gossip). Mrs. Muhs, President of the club, is a highly educated lady, who knows well how to preside over and give zest to the meetings. At home she helps instruct her children, and is now giving her daughter lessons on the piano. Two young ladies, members of the club, are taking lessons from the Boston course of home study.

In all these homes the best literature of the day is to be found, books, magazines, being freely exchanged. One young lady, in speaking of the *Woman's Kingdom*, said: "I love Mrs. Harbert, though I have never seen her, just from reading her articles. In every number there is something that exactly meets my wants and encourages and helps me."

My hostess, Mrs. L. B. Holly, does her own work, taking care of her two little girls, teaching them herself, and yet finds time for reviewing her French and history. For recreation, besides her reading, she botanizes and sketches, paints in both oil and water colors, and writes an occasional article in prose or verse, as the spirit moves, for different papers.

One summer, while making butter from the milk of a dozen cows and doing the rest of her work, she reviewed thoroughly the arithmetics and grammars now in use in our common school, that she might be competent to instruct her children as they become older. And yet these women are not so devoted to "high art" that they lose all human sympathy. They are loving and neighborly toward one another, kind and charitable to all around them, and even the scamp goes not hungry from their doors.

Close by lives an aged couple, Father and Mother Holly, who three years ago celebrated their golden wedding, their children and grandchildren coming from far and near. They are hospitable people, of sterling worth and unusual intelligence, still active and industrious. Mrs. Holly goes from cellar to garret as occasion demands, her hands still busy, her earth work not yet finished.

One evening, as we gathered around the piano, singing some of the grand old hymns, she joined us in an old-fashioned falsetto, her voice still clear, though feeble. As I looked upon her aged form, and thought how near she was to the "heavenly choir," she became glorified in my eyes, and her voice seemed like unto an angel's. Thank God for the divine gift of music, that gives expression to the highest aspirations of our nature. And thank God, too, for the noble old mothers whose pure lives are a benediction to those around them.

AN EDUCATIONAL CRITIQUE.

AMONG the many interesting articles in *The School Journal* for October, are two which have a peculiar interest to me. One, the "Wonderful History of a School District," the other an editorial expressing regret that there are not a greater number of good academies in the State.

I visited the district named in the first article a few years since, and was at the time very forcibly impressed with the character of its people. There was an appearance of refinement and intelligence not seen in many neighborhoods which I had visited. The question then with me was, Why such a difference in the character of these people from that of those found in many country places? At the time, I settled it by giving the credit to Jefferson College, which had been located within reach of the district, not knowing that previous to the erection of the college, the district had possessed educational advantages superior to most country places.

I left Canonsburg, when my visit ended, very fully convinced of the great advantage schools for higher instruction are to the neighborhoods in which they are placed, and as fully satisfied that it is a mistake for the State to encourage and build up in a few localities large institutions, which must and do crush the smaller ones which certain districts could and would support.

But Chartiers township is not the only district in which have existed higher institutions which have greatly benefited them—in many instances erected by the hard-earned money of the residents, that their children might have advantages which they could not afford to give them from home. And if I mistake not, the cry from every one is, "Would that we had our academies again!"

I am aware of the fact, that the downfall of the academies is not wholly due to the aid which the State has given to a few large institutions, but I do assert that it is largely due to that. I am also aware that the State is extending this aid under the plea that she must educate her teachers. I do not deny such a right; but I assert that she is not confining her beneficiaries to that work—consequently, has not only wronged those who may have had their all invested in academies, but also the neighborhoods in which they have been located.

Having seen, as I think, the great advantage which institutions for higher instruction have been to the people of the "wonderful school district," and having realized by experience the effect which the State's aid to a few large institutions has had upon her academies, you cannot wonder at my interest in the two articles named.

W. T. SEAL.

OVER THE SEA.

LETTERS FROM THE EDITOR.—NO. XV.

ON THE WAY TO ROME.

AT Geneva, we finally resolved to extend our tour to Italy, and this somewhat shortened our stay in the finest and most interesting of Swiss cities. Geneva has special attractions for an American, as being one of the principal sources in Europe from which have emanated those principles of political and religious liberty so dear to him. Besides, it is now, as it has been for hundreds of years, a noted seat of science and education. It was in Geneva that John Calvin secured a safe retreat from the persecutions he had met with in his native country, France, and for nearly thirty years promulgated his doctrines to the world. The philosopher Rousseau was born in Geneva, and there found admirers of his most radical social and political views in some, and tolerance for them from all. Geneva has also been the birth-place of many distinguished persons, among them De Luc and de Saussure, the naturalists; de Candolle and Brogniart, the botanists; Say, the political economist; Sismondi, the historian; Necker, the famous banker and financial minister of Louis XVI, of France, and his world-renowned daughter, Madame de Staël. The city is situated at the south end of Lake Geneva, on both sides of the Rhone, the waters of which, at this point, rush from the lake with great swiftness. The quays along the river are broad and beautiful. There are some fine streets lined with handsome shops and stores; but the old town, the Geneva of history, is noted for its steep, crooked, narrow streets, and its quaint, ill-shaped houses.

In our hurried rambles about the city, we saw in the Square des Alpes, the monument recently erected to Duke Charles II., of Brunswick, who left a large sum of money to

Geneva. It is in the style of the Tombs of the Scaligers, which we subsequently saw at Verona. The National monument, near the lake, a handsome bronze group, representing Helvetia and Geneva commemorating the union of 1814. The statue of Rousseau, in a pleasant little island in the Rhone. The house of Calvin, in the Rue des Chanoines. The house stands in some distance from the street, and has a yard in front. It is a middling-sized, two-storied building. On its front there is a slab with the significant motto in Latin: "*Dominus est Propugnaculum Meum. 1706.*" The cathedral, completed in 1024, but much changed since that time. The pulpit contains a chair once used by Calvin. The Hotel de Ville, a large building, containing the public offices of the Canton and the city. Instead of stairways there is in the interior a curious piece of architecture in the shape of an inclined plane, paved with stone, extending to the upper stories, enabling the officers, in ancient times, to *ride* to and from the council-chambers. It was in a room in the Hotel de Ville that the Alabama Claims were arbitrated. The furniture remains now as then, and we noticed the seats of the Commissioners, as well as of the several attorneys who presented the case. On the wall there is a marble tablet with the following inscription in French: "On the fourteenth of September, 1872, the tribunal of arbitration constituted by the treaty of Washington, rendered in this room its decision upon the Alabama Claims; thus settling in a pacific manner the differences that had arisen between the United States and the Kingdom of Great Britain."

Geneva is noted for its good schools, public and private. Some account of them will be given hereafter. Their spirit is shown by the following inscription on the central part of the new University Building: "*Le peuple de Geneve en consacrant cet edifice aux etudes superieures rend hommage aux bienfats de l' instruction garantie fondamentale de ses libertes. Loi du 26, Juin, 1867;*" or, in English: "The people of Geneva, in consecrating this edifice to higher studies, desire to show their profound respect for the benefits of education as the foundation of their liberties. Law of June 26, 1867."

Among the most interesting educational institutions are the schools for imparting instruction in watch-making and working in bronze. Watch making is the leading industry of the city, and to prepare skillful artisans in this department a school of a high grade and a full course of study and work, called the Academy, have recently been established at the public expense. The cost of the building alone was a million of francs. The institution is supported, as we understand, in all respects as a public school. Even the material furnished for the workshops and the machinery used are supplied without cost to the pupils. The graduates of the school are prepared for the business of practical watch-makers without serving an apprenticeship. Desiring to see a Swiss watch factory, we stepped into the great establishment of Petek, Philippe & Co., and were politely shown through it. This company employs several hundred men and women. The machinery used seems to be quite like that of our watch factories at home; but we were told that in Switzerland the finer watches and the finer parts of watches of all grades are made by hand. Swiss experts allege that in the higher departments of watch-making machinery can never compete successfully with skilled hand-work, and we were almost ready to believe it when the costly treasures of the safes were laid before us. Our sense of patriotism, however, was saved from a wound when the Manager of the House pronounced a Lancaster watch placed in his hands, "the best watch made in America."

Nor should we omit to mention the peculiar manner in which Geneva women do their washing. There are several long, wooden sheds built on piles in the swift-flowing Rhone. The floors are almost on a level with the surface of the river, and along the open sides there extend large washboards reaching into the water. At these boards, with piles of clothing washed and unwashed, stand in rows, hundreds of stout-looking women, who, seizing the garments one at a time, first fling them into the stream, next soap them thoroughly, then with wooden clubs beat the dirt out of them, and finally rinse and wring them. The rapidity and vigor with which the work is done is amazing, and the whole arrangement, though odd enough, is much better and in better taste than the way they do the same kind of work at Turin, where we saw large numbers of women washing in the Po, standing with bare limbs in water two feet deep.

But we are now on the way to Rome, expecting to make stops at Turin, Genoa, and Pisa. For twenty-one miles along the railroad, down the Rhine valley to Bellegarde, the territory is Swiss. We then run some seventy miles through a corner of France, stopping at Culoz, Aix-les-Bains, and Chambrey, and enter Italy at Modane. Here

there is a French and Italian custom house, and all baggage must be examined. The scene is ludicrous in the extreme. A couple of hundred passengers, men and women, leave their compartments in the cars and rush towards the custom house, with their trunks, valises, carpet-bags, satchels, and packages of all sizes and shapes, and the first comers place them on a counter which runs partly around the inspecting room, the rest waiting a chance to do the same; then, the baggage is opened piece by piece, and the search begins. What a Babel of languages! What a medley of articles cover the counter! Tidy women are amazed, modest women blush, ill tempered women scold. Men, if bold, threaten; if bad, swear; if shrewd, manage to have their things examined quickly and without trouble. We were lucky at Modane, not being required even to open our valises. In some cases, however, a very thorough search was made, every nook and corner of the trunks being examined. Tobacco and cigars seem to be the principal contraband articles. We saw several packages taken and confiscated. One woman was found to have three packages, which she declared to be for her own personal use; two of them were taken, and in consequence her anger was very fierce. This farce, as it seemed to us, being ended, we resumed our seats in the cars and in a few minutes entered the Mt. Cenis tunel. This famous tunnel is considered a masterpiece of engineering. It is eight miles long, twenty-six feet wide and nineteen feet high, cut through the centre of the Col de Frejus, a mountain over 8000 feet above sea level. The mountain was literally bored through by machines, worked by means of compressed air. The excavations were commenced about the same time at each end of the tunnel, and in a little less than ten years the machines met in the centre, 4093 feet below the surface at the top of the mountain. The cost of the work was $15,000,000. Not only the Mt. Cenis tunnel, but the whole railroad from Geneva to Turin, is a wonderful construction. It has a double track all the way. The country is very mountainous, and the road winds up and down and over and between the mountains, with the skill of a chamois. Huge walls support the structure, in many places hundreds of feet high; the bridges are all of cut stone, and as solid as the rock out of which they were hewn. There are deep cuts walled on both sides to the summits, and the mountains are pierced by no less fifty tunnels.

The country passed through in the long ride, has much of interest. There are many beautiful streams and rich valleys, and one may enjoy from the car windows fine views of Alpine scenery almost all the way. For some time after leaving Geneva the houses are built after the Swiss cottage style; then came the white, square, unporticoed, peak-roofed houses of France; and finally you are introduced to the neglected, tumble-down cabins of the Italian mountaineers, and in contrast the fine residences of the husbandmen of Piedmont. Women everywhere work in the fields in large numbers. Grain is cut with scythes. Thrashing is often done in the most primitive manner, oxen and mules being used to tramp out the grain on the hardened earth. We saw as we passed through the hilly parts of Italy, hundreds of mules engaged in carrying hay and grain from the fields on their backs, sometimes tied up in huge bundles with ropes, and sometimes packed in large linen bags. The principal crops are wheat, rye, oats, potatoes. In the level country, near Turin, we came in sight of large fields of Indian corn. The vine, of course, is found almost everywhere, and we saw many fine orchards, with trees loaded with fruit. In addition to matters of this kind, new to us, there were objects seen every now and then which seemed to remind us that the country had a history stretching far back into the past. At Aix-les-Bains there is a Roman triumphal arch, of the third or fourth century, and other interesting antiquities. At Chambrey may be found an ancient château, still occupied, built by the dukes of Savoy in 1230. Near Montmelian one can see the ruins of a famous old castle, destroyed by Louis XIV. in 1705, and at Susa an arch built by Augustus.

Turin is the capital of Piedmont, the former seat of the present reigning family of Italy, the scene of Count Cavour's earliest efforts in behalf of constitutional liberty, and the source of much of the republican leaven that has liberalized Italy. It is finely situated on the banks of the Po, and contains a population of over 200,000. Unlike any other city in Europe, it is laid out in rectangular blocks, with broad, straight streets, like Philadelphia. There are many beautiful gardens and squares, and few cities in Europe can present finer houses and stores than can be found in the neighborhood of the Piazza Castello. The streets leading from this point are flanked with arcades containing many handsome shops; and at the south-east corner of the

Piazza is the Industrial Gallery, an immense open structure, filled with stores, offices, concert rooms, cafes, etc., all arranged in the best of taste, and when lighted with gas constituting a scene of great brilliancy.

The Piazza Castello is the centre of the city, and the point from which the finest streets diverge. In the centre of the Piazza stands the Palazzo Madama, the lofty, grim old castle, erected in the 13th century. On the north side is the Palazzo Reale—Royal Palace—a large, plain looking, brick building, occupied by the king when in Turin. Near by is the edifice containing the Royal Armory, and also the Palace Garden and the Zoölogical Garden. We paid a brief visit to the Academy of Natural Sciences, with its fine collections, and also stepped into the handsome court of the University. We had a pleasant walk along the Po, and took a good look at the public garden on its banks, near the chain bridge. We were pleased with Turin. Its people compare favorably with any we had previously seen in Europe in dress, manners, looks, intelligence and public spirit. The lower classes especially are of finer form, of more attractive features, less stolid, less deformed by hard work, than those of Germany, Switzerland, or France.

A ride of five or six hours from Turin brought us to Genoa. While at the station, and before we fully realized where we were, we noticed across the street in the Piazza Acquaverde a fine marble statue of Christopher Columbus. The statue rests on an anchor, and at its feet kneels the figure of America. We take off our hats and salute the discoverer of America in his own home; and then enter our carriage and drive rapidly to the Hotel de Ville, our stopping place. We dine, and afterwards call a carriage and spend the evening in making a reconnoissance of the city. Its oldest parts seem to be a labyrinth of narrow, crooked streets, lined with massive stone buildings, often of great height, but with few and small doors and windows. Many of them look like fortresses, the windows being protected by strong iron bars. But near the Piazza Fontane Morose, there begins a line of streets, the via Nuova, via Nuovissima, and the via Balbi, which are broad and straight, and on which are located the finest churches and many of the palaces of the Genoese nobility, among the most splendid in Europe. We left our carriage for a walk in the park of Acqua Sola, where we heard some fine music, thence extending it to the Garden of Villa Negro near by, and finally to the promenade on the city walls. We thus obtained some good views of the city and harbor and their surroundings. We gazed out upon the sea itself with intense interest, the scene awakening a flood of pleasing memories and associations.

Genoa is situated in a semicircle on the sloping side of a mountain, forming as you look up at it from the sea a vast amphitheatre, with rows of houses instead of seats. There is nothing of the kind in the whole world more beautiful. Surrounding the city, running along the crest of the hills and down their slopes, are the ramparts and the fortifications, which look very formidable. We counted no less than ten detached forts. The harbor is semicircular, and protected from the open sea by two piers. The entrance is guarded by two light-houses. Several steamers and a goodly number of ships lay along the quay; but, although we notice the English and French flags, the Stars and Stripes is nowhere to be seen. A lofty wall runs between the city and the central part of the harbor, on which there is a marble platform twenty paces wide, forming a most delightful promenade.

We visited two of the most interesting cathedrals in Genoa, the Annunziata and the St. Lorenzo. The former was erected in 1587, and is exceedingly rich. The portal is borne by marble columns, and twelve columns of white marble support the vaulted dome. The gilding of the interior is so profuse and so heavy that it almost seems that the whole structure is of gold. The principal altar is of the finest marble, and its furniture of solid gold and silver. St. Lorenzo is an old church, erected in 1100, but subsequently much altered. Its style is very peculiar, combining that of several ages and of different countries. The façade is decorated with some fine sculptures. Within, there is a number of interesting monuments, and some good pictures and statues. There is also shown to the curious, in a stone arca, relics of John the Baptist, brought from Palestine during the Crusades; and in the sacristy, the vessel out of which the Saviour and his disciples are said to have partaken of the paschal lamb, and in which Joseph of Arimathea is said to have caught some drops of the Saviour's blood.

Genoa was noted in the past for its splendid palaces. It was this that gave it the name of "La Superba." Some of them have disappeared and others have been converted to base uses. The hotel at which we stopped was an old palace. The very floors are of marble. We saw butchers selling

meat, and grocers waiting on their customers, in marble shops. But even now, probably, no city in the world of its size has so many fine palaces, or palaces so richly furnished, as Genoa. Although most of them are private property, they are at times open to the public, and we were permitted to visit several of them, the Palazzo Reale, the Palazzo Rosso, and the Palazzo Bianco. Many of the palaces are plain on the outside, and you would never suspect the sumptuous character of the interior without entering them. Others have handsome façades, beautiful verandahs, and imposing portals Upon entering, you find yourself in a vestibule, generally opening into a beautiful court-yard with fountains, flowers and statuary. The upper stories are approached by superb marble staircases, the pride of the establishment. The apartments are in suites, most richly furnished in different styles, and enriched with frescoes, paintings, engravings, statuary, mosaics, bronzes, and costly articles of vertu. In some cases there are large balconies filled with flowers, and the roofs are converted into the most beautiful gardens. Indeed, roof-gardening is quite common in Genoa.

By way of contrast, we went from the palaces to the markets. Here were many hundreds of people buying and selling, mostly women. Those who sell endeavor to attract buyers by peculiar cries, very loud and very shrill, creating the greatest noise and confusion. The market people seem much inferior to the same class of people at Turin. We were particularly struck with the great number of dwarfs among them. The fruit market was very fine: peaches, pears, grapes, lemons, oranges, figs—as large and luscious as any we ever saw. The marketing is mostly brought in by women on the backs of mules, in donkey carts, or in baskets on their own backs or heads. Remembering that Genoa has been, for hundreds of years, a great money centre, and that the great Banco di S. Giorgio once ruled the city, and almost converted it into a commercial aristocracy, we went to the Bourse, and we needed nothing more than the money making faces we saw there to show us the source of the city's wealth.

An interesting incident of our stay was an excursion to the Villa Pallavicini, six miles from the city. Stopping at the lodge, we approach the buildings by a magnificent avenue bordered with trees, then up a series of marble steps to a broad platform of marble, looking down a hundred feet or more upon the gardens, finely laid out and containing specimens of the rarest and most beautiful native and tropical plants and trees. The park covers a hill of considerable height, rising back from the buildings, and aided by its natural capabilities, art has converted it into a paradise. Whatever trees, shrubbery, flowers, vines, drives, walks, pathways, retreats, arbors, labyrinths, surprises, lakelets, grottoes, tunnels, fountains, islands, bridges, waterfalls, rivulets, fish, birds, monuments, statues, kiosques in different styles, obelisks, towers, etc., etc., can do to make nature picturesque and lovely has been done in these grounds by the Marquis Pallavicini, to whom they belong. At the very top of the hill, about which the park is laid out, there stands a castle after the style of the middle ages, from which is obtained a beautiful view of the country, Genoa, and the sea. The castle is supposed to have been besieged and finally captured, and near by is the mausoleum of its commander and the burial place of his soldiers. Off on another hill is seen the opposing fortress that has wrought the ruin.

We also drove out some two miles to the Campo Santo, said to be the finest cemetery in Italy. The entrance is by a splendid marble gateway. The enclosure is a quadrangle, with a colossal statue in the centre, and a fine rotunda in the middle of the upper end, approached by a series of broad marble steps. Around the whole runs a double gallery, or arcade, divided by a thick wall of marble. The floor and the roof are also of marble. The dead are buried under the marble floor and in the marble wall. There are monuments, urns, vases, tablets. One can look along these marble galleries for hundreds of yards, and see the beautiful memorials of the dead, many of them decked with flowers, hung with wreaths, or rendered more sacred by votive offerings. It would almost seem less hard to part with a friend, if he could be buried in a place so solemn and yet so lovely.

Another day's journey and we will be in Rome; but we break it for a few hours at Pisa to see the Cathedral and the Leaning Tower. The Cathedral was begun in 1063, and consecrated in 1118. It is 312 feet long, and 106½ feet wide, with transepts 238 feet, and built entirely of white marble. The finest part of the Cathedral is the façade, but the interior is rich and imposing. Connected with many of the earlier cathedrals, there were erected separate structures for the baptism of children, and towers for the bells. In this way we account for the Baptistery and Campanile, or Leaning Tower, at Pisa, both belonging to the Cathedral, situated near it,

and used for its purposes. The Baptistery is a circular structure, 100 feet in diameter and covered with a dome 190 feet high. It is built wholly of marble. The Leaning Tower is also built of marble, and is, as is well known, a perfect cylinder 53 feet in diameter and 179 feet high. It was built 700 years ago, but still looks fresh. The tower is formed of eight regular tiers of columns, supporting arches, one above another, and forming as many open galleries running around the cylinder. The top is surmounted by a graceful belfry, where seven bells are hung, the largest weighing 12,000 pounds. The tower leans thirteen feet out of perpendicular, and in looking at it one can hardly resist the impression that it is going to fall. The cause of the inclination is unknown, but it is probably owing to the settling of the foundation while in process of erection, which lasted nearly two hundred years. Of course, we climbed the 296 steps to the top, but I am free to confess that I felt safer on the upper side, and that I would have enjoyed the magnificent view better if the tower had stood erect. Quite as interesting as either the Cathedral or the Tower, is the Campo Santo, the burial ground near by. The earth here, to the extent of fifty-three ship loads, is said to have been brought from Mt. Calvary, when the Holy Land fell into the hands of the Saracens, about 1200. The rectangular burial ground is surrounded by galleries, or arcades, as at Genoa, but built in a somewhat different style. The galleries are forty-six feet high and thirty-four feet wide, and contain some celebrated frescoes and many fine monuments.

It was late in the afternoon when we left Pisa, and near midnight when we reached Rome, so the darkness gave the imagination full play the first night we spent in the Eternal City.

MISCELLANY.

I. EDUCATIONAL NOTES AND PERSONALS.

MR. J. L. BURRITT, of Elmira, has charge of the graded schools of Canton, Bradford county.

Mr. H. E. Raesly has accepted the principalship of the schools at Wellsboro, Tioga county.

M. C. Butler, Superintendent of the schools of Cass township, Schuylkill county, reports them in an excellent condition.

Prof. H. G. Weimer, formerly of Bedford, Pa., has been elected principal of schools of Cumberland, Md.

Mr. Harvey B. Houck, a graduate of Cumberland Valley Normal School, has charge of the schools of Upland Borough, Delaware county, and has prepared and published a course of study for same.

Ex-County Superintendent James C. Graham, of Crawford, is doing good work as principal of the union graded schools of Mercer, Pa.

Gov. Hoyt will deliver an address before the Pennsylvania Historical Society, on the subject of the Connecticut claims, or what is more familiarly known as the "Seventeen Townships." The intimacy of the gentleman with the matter named, and his ability in gathering together and presenting all points of information bearing thereon, will doubtless make the address a very interesting one, and the paper will be of value to Pennsylvania teachers.

Owing to the death of several members of its Board of Trustees, Lafayette College loses about $4,000 from its usual annual income.

The superintendent of Clearfield county is preparing to hold a "fair" of scholars' and teachers' work during the county institute, to be held in December. Let all take an interest.

W. A. Ambrose, principal of the Osceola schools, has published a series of rules and regulations for the government of the schools. A. E. Wooldridge, of the Commercial College at Poughkeepsie, N. Y., will have charge of the West Clearfield school this winter. Over 350 pupils are enrolled in the Leonard graded school.

Prof. B. S. Potter, of Missouri, has been elected principal of the Cumberland Valley State Normal school, and the fall session of that institution has opened under his direction. Pennsylvania teachers will give him a cordial greeting.

Prof. J. B. Johnson and wife have charge of the graded schools of Wilcox, Elk county, Pa. The Board knew where to get active and energetic teachers.

Prof. R. M. Streeter, of Toledo, Ohio, has been elected and commissioned superintendent of the public schools of Titusville, Pa.

Prof. E. Francis has charge of the schools of Bedford, Bedford county.

Miss Lizzie Fletcher, a graduate of Vassar College, fills a position in the Titusville High School.

Founders' Day, instituted in honor of Hon. Asa Packer, was properly observed at Lehigh Valley University. Bishop Howe delivered an able address.

Rev. T. M. Elder, president of School Board of Dayton, Armstrong county, extended an invitation to superintendent, teachers, and directors, to dine with him on examination day at the Dayton Hotel.

The New York Board of Education has appointed John Jasper Superintendent of public schools, in place of Mr. Kiddle. Mr. Jasper has held the position of Assistant Superintendent of Public schools of the city for several years.

In the Freshman class at Yale College there are eighteen students from Pennsylvania, and fifty from New York.

Eton College, England, has established a factory, a building of three floors, in which various mechanical appliances are to be erected, so that boys may be taught the practical use of tools.

During the month of October, Prof. Breidenbaugh, with the senior class of Pennsylvania College, Gettysburgh, Pa., will spend a week on a mineralogical excursion to the great oil region of the state and other points of interest.

Miss Marie Kemp, a graduate of Swarthmore college, is assistant teacher in St. James' Select School of Lancaster city. This school is under the charge of Miss Mary Martin, a graduate of the State Normal School at Millersville.

Miss M. Lizzie Dickey, a graduate of Millersville State Normal school, is principal of the State Normal school at Fairmount, West Virginia. She has been connected with this institution for some years, and was vice principal previous to her election to the principalship.

Mr. A. M. Snyder, of Juniata county, is principal of the preparatory school of Dickinson Seminary, at Williamsport, Pa.

Prof. J. H. Brumbaugh, of the class of '74 of the Millersville State Normal school, is President of the Faculty of Brethren's Normal College, Huntingdon, Pa.

Prof. J. V. Montgomery delighted the Harrisburg Teachers' Institute with one of his interesting lectures on the subject of drawing, and the manner of teaching the same.

Miss Maria L. Sanford, during the past month, addressed a series of educational meetings in Greene county.

In the high school of the city of Harrisburg, there are three colored boys pursuing the regular course of study and enjoying the full advantages of the school. Let the doors of our public schools be open to all, without distinction as to race or color.

In recognition of the mathematical powers of Miss Christine Ladd, a young graduate of Vassar college, she was recently invited by the trustees of John Hopkins University to continue her studies there, with an annual stipend equal to that of a regular fellowship. She has just been asked also to pursue a special course at Harvard, under Professor Pierce.

Baltimore celebrated, Sept. 21, the semi-centennial anniversary of the opening of public schools in the city, an event well worth celebrating. There are now more than half as many schools as there were pupils in 1829, and four times as many teachers as there were pupils then. The number of pupils increased in fifty years from 200 to 35,000, and there are are now 121 schools and 820 teachers.

Whether Pennsylvania air or Pennsylvania schools are responsible for the results of the examinations for cadet engineers in the Navy, it is a satisfaction to know that there are ten Pennsylvanians out of twenty-five admitted candidates.

Two Indians from Hampton are to serve as teachers for the 250 young Indian pupils whom Captain H. C. Pratt is collecting in the Indian country for the new industrial school at Carlisle, Pa.

Synd Abdulla Khan, the most accomplished English scholar the Mahometan community of India has yet produced, has just died in an Indian city where he was headmaster of a school. He used to be professor of Hindustani in the University of London.

A descendant of a family which, for more than a century, has furnished the country with first-class criminals, came into public notice, recently, in a court room at Freetown, Mass. Elias Phillips is his name. He appeared as a witness in a burglary trial, and had turned State's evidence. Malbone Briggs, the notorious criminal of three generations back, who at one time was in prison with all her seven sons, was his great grand-mother. His family line can be traced directly back 200 years to a noted pirate of the time when the Earl Ballamount was the royal Governor of New York. Phillips' right arm is withered, but he was able to make with his left the two keys by which the store was entered. He can also sail a boat and shoot a gun.

At the National Training School of Cookery in London, a distinguished professor, Church, is giving a series of lectures on "The Chemistry of Foods," thus combining in one course of instruction the teaching of the physiologist and chemist and the training of the cook. The superintendent of the school, seeing the need of practical instruction in the science of foods for the pupils as well as the practical management of the kitchen apparatus, arranged for these lectures. Professor Church's handbook, prepared for the Science and Art Department at Kensington, has been a text-book in the school, and the illustrations and experiments he introduces in his lectures are to show by demonstration what he has expressed in words.

The school of Arts and Trades at Stockholm in 1877 instructed 2,673 pupils, of whom 810 were women and girls. The elementary technical schools give a higher grade of instruction, involving a course of three years, and including chemistry, mechanics, mineralogy, geology, mathematics and workshop practice. At Böras there is a textile school for weaving, the course of instruction in which is from one and a half to two years. The Chalmers school furnishes a high class of education in natural science for those who are going into the various professions. Stockholm has a Polytechnic school, and it absorbed, in 1869, the Mining school at Falun. All these schools have a good attendance.

SCIENTIFIC NOTES.

THE Pittsburgh glass works employ about 5,000 men, and supply more than half the glassware now used in the United States.

IT is computed that the offspring of a single oyster during the spawning season amounts to 2,000,000. Of these, however, only a few hundred survive. The newly born oyster is much smaller than a pin's head and bears little resemblance to the parent.

AT an "aged home" for animals in the environs of Paris there is a cow 36 years old, a mule 72, a pig 25, a goat 18, and a goose 37. None of them are human!

Within the last 40 years the average speed of Atlantic steamers has increased from 8.3 knots (nautical miles) to 15.6 knots an hour, while the consumption of fuel per horse power has diminished about 60 per cent.

Lead-pencil marks may be preserved by dipping the paper into skimmed milk, drying, and quickly ironing it on the wrong side.

Glass sleepers for railroads are the latest thing in that line in England. The glass is toughened by a process discovered by Frederick Siemens, of Dresden, the cost per ton being about the same as that of cast iron, but there are three times as many sleepers in a ton.

It is asked why the Electric Light, with its power to penetrate long distances, is not used by steamships at sea, so as to lessen the chances of collision. At least one of the steamships sailing out of the port of Philadelphia has apparatus for such a head-light, as also electric lamps for her dining saloon; so if the

electric light is not shown at sea, it is not for the lack of apparatus.

The work of tunneling the Hudson river to connect Jersey City by railroad with New York was begun about five years ago, but soon suspended by reason of a litigation brought on by railroads and private citizens opposed to the project. The decision of the courts recently given was favorable to the company, and the work has been resumed. The tunnel will be 12000 feet long, 26 feet wide, and 24 feet high; and will be 60 feet beneath the bed of the river. It will enable about 400 trains to enter New York every day. It is estimated that this great work will cost $10,000,000 and be completed in two years.

A medical journal gives the following statistics in regard to memory: Inferior races, as the Negro and Indian, have better memory than races more highly civilized; women have better memory than men; feeble persons of lymphatic temperament a better memory than the strong. This faculty is impaired by over eating, by physical exercise, and by education. We can remember better in warm than in cold climates, in summer than in winter, in the morning than in the evening.

Ptof. Marsh, of Yale, has been finding more toothed birds among the Wyoming and Colorado fossils, besides the petrified remains of 300 or 400 dinosaurs, a mammoth kangaroo of the crocodile order, sometimes 100 feet long, and about 1,000 pterodactyles, a sort of contemporary flying dragon, with a spread of wing of 30 or 40 feet.

Prof. Pierce, of Harvard College, has startled the scientific world by declaring that far beyond the uttermost planet bounding our solar system is a vast spherical shell of matter broken up into small fragments, from which come the meteors. This shell he calls the home of the meteors. He gives the reason why some such such theory must be adopted to explain the movements of the planets and comets, and the persistence of the constant amount of heat given out from the sun. The hitherto accepted theory that comets may be, and some necessarily are, strangers to our system, he rejects.

It would certainly be a great boon to the world if the general level of scientific education could be raised, so that each young man or young woman, when he or she issues from school-doors, should have enough definite knowledge of the great laws of the physical universe to instantly denounce blue-glass theories, and attempts at perpetual motion, not from the pride of knowledge, but from the feeling that error, credulity, and superstition should be combatted with truth.

Dr. R. H. Ward, of Troy, describes a method by which much of the structure of leaves may be preserved. A piece of dry leaf is laid on a thin piece of platinum, or mica, covered with mica or colored glass, and heated on an alcohol lamp until the organic matter is burnt out, and the mineral matter or ash remains. This is droppod on a slide wet with turpentine, and very carefully mounted in soft balsam. The preparations show the construction of the parenchyma, veins, epidermis, stemates, and hairs, with great beauty and distinctness.

Botany.—The Italian botanist, Professor Caruel, has recently proposed to divide the vegetable kingdom into five groups, setting aside the ancient classification. His groups are as follows: 1. Phanerogamia or flowery plants, divided primarily into Monocotyledrones and dicotyledrones. 2. Schistogamia, including the characcæ only. 3. Prothallogamia, conterminous with vascular cryptogams and divisible into heterosporæ and isosporæ. 4. Bryrogamia, synonymous with muscineæ, and divided into musei and nepaticeæ. 5. Gymnogamia, corresponding to thallophyta, an assemblage which Caruel believes will ultimately be broken up into several primary groups.

Prof. F. A. March, of Lafayette College, Easton, Pa., invites every one interested in the history and etymology of language to assist in the preparation of the immense historical dictionary of the English language now in preparation. This work is to contain four volumes, each as large as Webster's quarto dictionary.

More than 1,800,000 gallons of petroleum reach the surface every day in the Pennsylvania oil regions. This product is yielded in such immense quantities that the means of storing it prove entirely inadequate, and it is estimated that 300,000 gallons daily run to waste. Most of the wasted oil flows into the streams of the region, and is finally carried to the sea. Our petroleum gives light to almost every people of the world. Not only do all neighboring nations use it, but it is found in far-off China, Japan, Turkey, Persia, Egypt and Palestine. It is burned by remote islanders, and illumines the rude mud huts on the banks of the rivers of Central Africa. At its present low price it affords a much cheaper light than that derived from any other source. It furnishes light at only about one-twentieth the cost of the cheaper gas.

The "mechanical harvester" so extensively used in the West binds the sheaves of wheat with wire. In threshing the bands are frequently broken, and bits of wire fall into the grain, causing serious damage to the machinery of mills in which it is ground. A complete remedy for this evil has been found in the use of magnets. The magnet is so adjusted that its poles are close to the stream of grain falling between the burs, and grasps the pieces of wire as they fall. This device is used in all the great flouring mills of Minneapolis.

An Experiment in Crystallization.—Procure at a drug store ½ oz. each of the following salts: Common alum, copper sulphate (blue vitrol), ferrous sulphate (green vitrol), sodium sulphate, ammonium nitrate, and potassium bichromate. Reduce each to a fine powder by rubbing it on a piece of paper or plate with a clean knife. Place the alum in a tea-cup, add about two tablespoonfuls of water and heat, at the same time stirring for several minutes over a coal-oil flame. Stand the cup aside for a few minutes to cool, and when there is no danger of the liquids breaking the glass, pour it off into a clean tumbler. Any residue of the salt that remains may be dried and preserved. Treat the other salts in the same way, being careful to rinse the cup each time it has been used. Then you will have strong solutions of the salts. Set the tumblers away where they will not be disturbed, and an interesting crystalline work will take place within them. Some of the solutions will begin to deposit crystals on cooling, while others may not begin for several days. Frequently examine the tumblers to note the progress of the crystallization. You will find that not only are new crystals formed, but that those already formed grow, increasing in size from day to day, also that the different crystals have different forms. Crystallize other substances, as sugar, common salt and epsom salt in the same manner. Many artificial compounds have the power to thus arrange their molecules in geometrical forms, and nature teems with structures which her crystalline forces wrought in other ages.

GUIDE ME, O THOU GREAT JEHOVAH.

Prayer from "ZAMPA." "PLACIDA." HEROLD.

1. Guide me, O Thou great Je - ho - vah! Pil - grim through this bar - ren land:
2. Op - en now the crys - tal fountain, Whence the heal - ing wa - ters flow;
3. When I tread the verge of Jor dan, Bid my anx - ious fears sub - side;
I am weak, but Thou art might - y, Hold me with Thy power - ful hand:
Let the fier - y, cloud - y pil lar Lead me all my jour - ney through.
Bear me through the swell - ing cur - rent, Land me safe on Ca - naan's side:
Bread of Heav - en, Bread of Heav - en, Feed me now and ev - er - more.
Strong De - liv - 'rer, Strong De - liv - 'rer, Be Thou still my strength and shield.
Songs of prais - es, Songs of prais - es, I will ev - er give to Thee.

FLAG OF THE FREE.

March from "LOHENGRIN."

Steady Time.

1. Flag of the free, fair - est to see! Borne thro' the strife and the thun - der of war;
2. Flag of the brave, long may it wave, Clos - en of God while His might we a - dore, In
Ban - ner so bright with star - ry light, Float ev - er proud - ly from mountain to shore.
Lib - er - ty's van for manhood of man, Sym - bol of Right thro' the years passing o'er.
For 𝄋: While thro' the sky loud rings the cry, U - nion and Lib - er - ty! one ev - er - more!
Em - blem of Free - dom, hope to the slave, Spread thy fair folds but to shield and to save,
Pride of our coun - try, hon - ored a - far, Scat - ter each cloud that would darken a star,
[While

Fine.

D.S.